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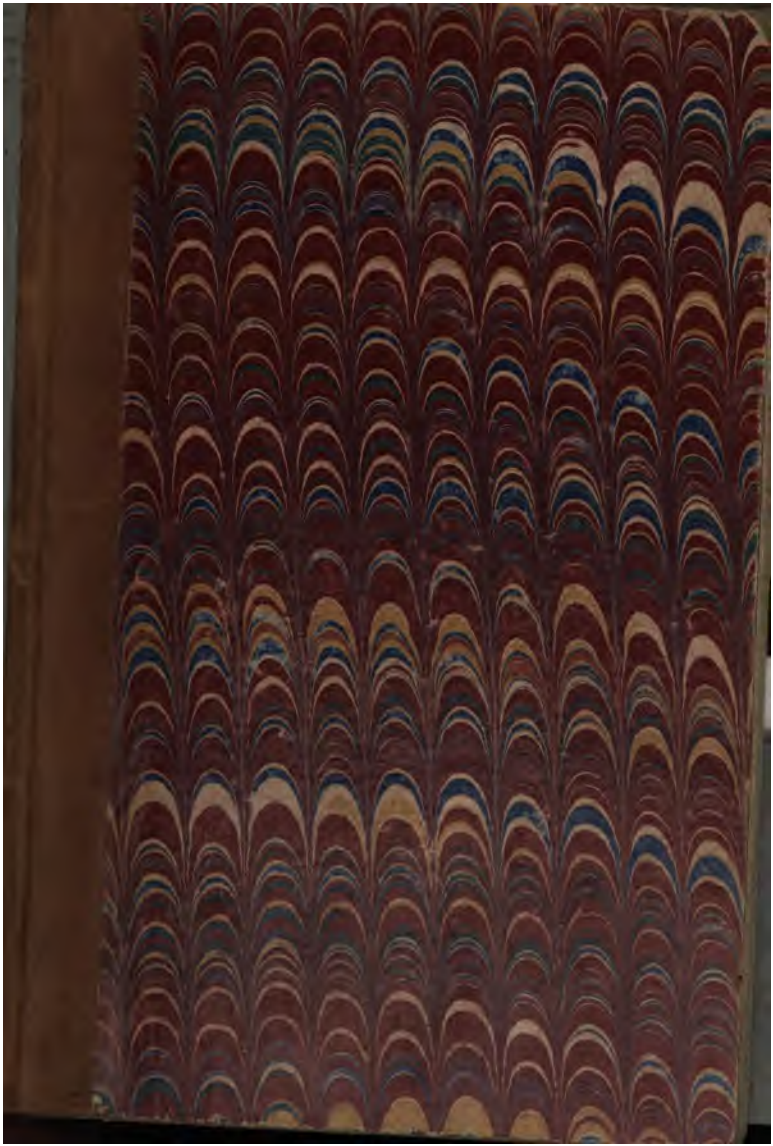
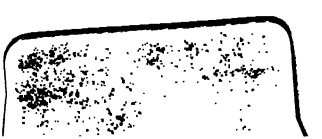
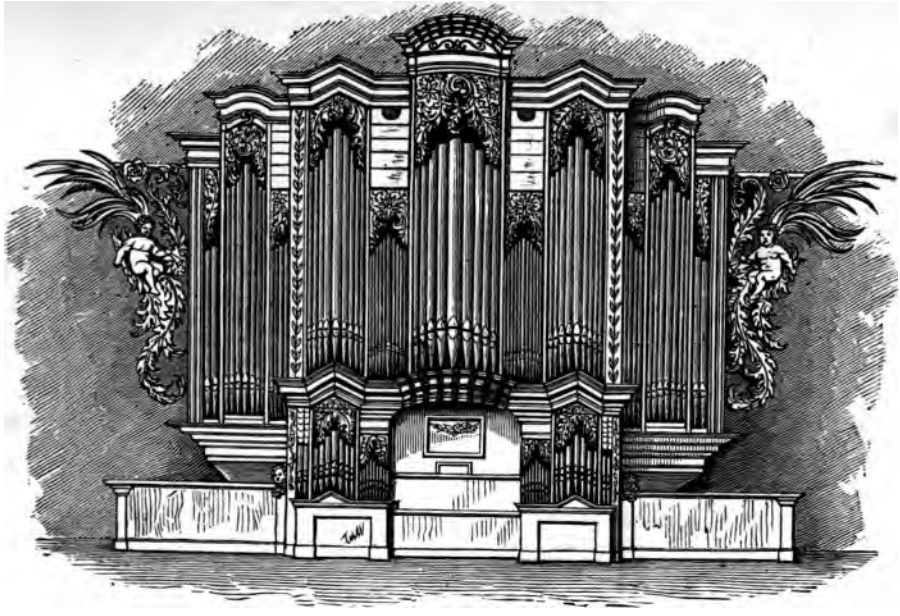




# CATECHISM OF THE ORGAN.



BACH'S ORGAN IN THE NEW CHURCH AT ARNSTADT.

# CATECHISM

OF THE

# ORGAN:

INCLUDING AN EXPLANATION OF ITS STRUCTURE, AND DESCRIPTIONS OF THE VARIOUS PARTS OF THE MECHANISM—THE STOP ETC.: WITH HINTS ON THE PROPER MANNER OF PLAYING, AND OF ACCOMPANYING THE MUSIC IN DIVINE SERVICE; MORE ESPECIALLY WITH REFERENCE TO THE TECHNICAL MANAGEMENT OF AN ORGAN DURING PERFORMANCE.

*WITH TWENTY-SEVEN ILLUSTRATIONS.*

BY

JOHN HILES.

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# PREFACE.

THE high state of cultivation to which the study of the Organ has now attained in England, and the great attention bestowed upon Organ playing, seem to call for a work which shall give some general, and yet comprehensive information, upon the construction of the Instrument, and its peculiar mechanical arrangements: matters which are not only very important, but are also indeed essentially necessary for an Organ player to know.

The explanations are given in the Catechetical form, and although not always so short and concise as may be desired, they are, it is hoped, at least clear and intelligible.

It must, however, be left to the reader's judgment to decide how far the desired object has been attained, and the endeavour a successful one, of explaining the general principles of Organ building, and pointing out the most important particulars: *the Author* merely observing, that as full and ample

an explanation as possible has been given of everything important relating to the technical and artistical management of an Organ.

But elaborate descriptions of mechanical works have always a certain want of clearness, and generally fail to give a distinct idea, and to place the particular point in a proper light, however accurate and copious they may be. In order, therefore, to render these explanations more intelligible, drawings and illustrations of each single part are added.

Here, again, a difficulty presents itself, in that in two Organs are alike in their mechanical arrangements; these being continually subject to changes and improvements, owing to the modern advancement and development in the various parts of Organ building.

May this little book contribute to the spread of knowledge in relation to the Art of performing upon the King of Instruments.

JOHN HILES.

London, 1876.

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# CATECHISM OF THE ORGAN.

## CHAPTER I.

### OF THE ORGAN IN GENERAL.

*Q.* What is an Organ?

*A.* An instrument, which, by means of pipes of various kinds, produces certain sounds. The name is derived from the Greek word ὄργανον: in Latin, *Organum.*

*Q.* How do the pipes produce the sounds?

*A.* As in other wind instruments, by a stream of air, which is produced by the bellows; and, by pressing upon the key, the air is admitted to the pipes, by means of mechanism, which opens, and closes, the holes connected with the pipes.

Organs are of different sizes, according to the space they have to occupy; and the rows, or ranks, of pipes, are distributed symmetrically in various compartments, in accordance with the size and form of the organ-case. In early times there were small

Organs, which were carried in processions. These portable Organs were called *Portative*, or *Regal* Organs; there were also others called *Positive*, or fixed: in later times the term *Positive* was applied to the Choir Organ, a small instrument placed at the back of the Organist.

*Q.* What purposes is an Organ designed to serve?

*A.* Organs are principally used in churches, to lead the Choräle or Hymn-tunes, and the other religious songs of the congregation; and also to accompany the melody sung by the priest. The Organ is also used in the performance of Voluntaries and other Church music; and a large Organ, with all the most recent improvements and additions, is now considered indispensable in a concert room.

*Q.* Are the pipes in the front of the Organ available for sounding, or speaking, as well as the others in the inside?

*A.* Yes; the front pipes in a large Organ generally belong to the Open Diapason of the Great Organ, the remaining pipes of which are placed inside. In small Organs the front pipes are only imitations, and do not speak.

*Q.* What distinctive names are applied to the various rows of keys?

*A.* The term *Clavier* means simply *a set of keys*, which may be either for the use of the hands, or the *feet: the word Manual* means, keys to be used by the *hands; those* keys played upon by the feet are called *the Pedal, Pedal-clavier*, or Pedal-board.

*Q.* How many Manuals are there?

*A.* According to the size of the Organ, there are one, two, three, or four Manuals.

*Q.* What are the Pedals?

*A.* A row of large, wide keys, placed under the Manuals, for the feet to play.

*Q.* What is the purpose of the different Manuals?

*A.* Each Manual has its own particular species of pipes. For instance, the first or lowest Manual, which is called the Choir Organ,* contains pipes of a narrow measure, and a soft, delicate, and somewhat penetrating tone, suitable for accompanying voices; the second Manual, the Great Organ,† contains pipes of a large scale, and a full, bright, tone; these are generally placed immediately behind the front pipes. The pipes of the third Manual, the Swell, are inclosed in a box, the front part of which is made to open and shut gradually by means of a *treadle*, or *pedal*, placed near to the ground, and convenient for the right foot of the performer. The fourth Manual, the Solo Organ, contains pipes of a particular species, on a high pressure of wind, and voiced especially for Solo playing, and in imitation of modern orchestral instruments.

In large Organs it is now usual to make the keys *projecting* or *overhanging*: that is, the keys of the *second* row project somewhat over the keys of the *first*, or lowest row; and the keys of the third row

* The *Positive* or *Positif*.

† In Germany the *Hauptmanual*.

project in the same manner over the keys of the *second* row, and so on. This brings the Manuals into a smaller and more compact position, and enables the player, as is often required in modern Organ music, to put down a key in each of two Manuals, at the same time.

The Swell was invented and first introduced in 1712 by Jordan, an English Organ-builder, and is a development of what was formerly called the '*Echo*' in old English Organs. The *Echo* consisted of duplicates of some of the Treble stops of the other Manuals; these duplicates were put into a *closed* wooden box, to render their tone soft and distant-sounding; and they were intended as an *echo* to the other parts of the instrument. Jordan furnished the front of the box with a *moveable shutter*, whereby the sounds could be made to increase or diminish in strength. This 'shutter' was afterwards superseded by what is called the *Venetian swell*, the front being composed of a series of *shades*, or *louvres*, each of which is hung on an axis, and by means of which not only a gradual *crescendo* and *diminuendo*, but also a *sforzando* can be produced; and when the louvres are closed, an imitation of an echo is produced.

The name *Echo* or *Echo-work* is still retained in some modern Organs.

A properly constructed *echo* should include repetitions of characteristic stops which appear in the *other* Manuals, but on a much smaller scale; and *also include a Mixture* stop and a Reed. See the 4th *Manual of the* 'Nicolai' Organ (Leipzig), Chap. 10.

*Q.* What is the compass of the Manuals?

*A.* Usually four octaves and a half, from CC to $g^3$ or $a^3$ in modern instruments. In older Organs the compass is different.

*Q.* What is the compass of the Pedal?

*A.* At the least two octaves, from CC to $c^1$. In new, and large Organs, the compass includes from two to five sounds more, from CC to $d^1$, $e^1$, or $f^1$. In some old and small Organs the pedals only include one and a half octave.

*Q.* What is the meaning of *Short* Octaves?

*A.* These only occur in very old Organs, where the keys appear to be in the usual order, but some of the lower chromatic sounds are omitted; thus, in old English Organs the CC♯ key sounded AA (the A below it; the CC♯ pipe being omitted): and the GG was sounded on an additional key placed next below the CC one. Other varieties of the 'Short Octaves' occurred both in the Manuals and the Pedals, particularly in German Organs. (See Chapter 17.)

*Q.* What is understood by a *Register*?

*A.* It is a name applied to the *Stops*, the handles of which are placed at the *side*, and also sometimes *over* the Manuals. By means of the *Stops*, or *Registers*, the wind has access to the pipes, or can be excluded from them. Some of these Stops act upon various other mechanical combinations, such as *Couplers*, &c. By a glance at the stops, the whole arrangement, or disposition, of the Organ, can be seen *at once*.

*Q.* What is understood by the Arrangement, or Disposition, of an Organ?

*A.* This generally means, the entire plan of the Organ, and of each single part. It especially shows the number and the variety of the stops, and their proportion to each other; as also the other mechanical arrangements, which are requisite in an Organ.

Before we inspect the interior of the Organ, we will first examine the stops in general, and the works connected with them.

---

## CHAPTER II.

### THE ORGAN STOPS.

*Q.* As the compass of the Manuals is but small, and the pitch, or acuteness, of the stops, is various; what is the *Ground* tone, or *Foundation* tone, of an Organ?

*A.* The *foundation stops* of the Manuals, are those of the 8-*feet tone;* to these are added those of 4, and 2 feet, &c., and also those of 16, and 32 feet: so that the sound of the Organ should not be of one particular quality or shade of tone.

*Q.* Why are the stops named 8-feet, 16-feet, 4-feet tone, &c.?

*A.* The ordinary concert pitch, the same as that of a *Pianoforte,* is known as the 8-feet tone, or pitch; and in an Organ stop of this kind the deepest note,

the CC, (sometimes called the 8-feet C,) is 8 feet long; therefore it follows that a pipe of 16 feet in length, sounds an octave deeper; one of 4 feet sounds an octave higher; of 2 feet, two octaves higher; and of one foot, three octaves higher.

This note CC, (double C,) the lowest note of the Manuals, is called in Germany the 'Great C'—but the English method of expressing these low notes is so thoroughly understood and generally received, that there is no necessity for adopting any other.

The C of 16 feet in length, is known as the 'CCC.'

*Q.* What are the sounds of a higher, or a deeper, pitch, than those above mentioned?

*A.* Higher sounds than those of 1 foot are not heard singly, but only occur in the *compound* or *mixture** stops, where, upon the C key, appears a pipe of 6 inches, and also a pipe of 3 inches, and in very acute mixtures, of $1\frac{1}{2}$ inch, and $\frac{3}{4}$ of an inch.

The deeper stops, of 32 feet, known as the 'CCCC,' are generally found in the Pedal; very rarely in the Manual, and then only partially and in very large organs, as will be seen subsequently.

*Q.* Is the *Foundation*, or *Ground-tone*, of the Pedal, the same as that of the Manuals?

*A.* No: the *foundation tone* of the Pedal is the 16 feet tone, to which, stops of 8, 4, and sometimes of 2 feet, are added. Very large Organs have also one or more stops of 32 feet.

* See page 11.

*Q.* What is a *Quint* stop, which is so often seen in an Organ?

*A.* A *Quint* stop is one of those called a *Mutation*, or *Filling-up* stop; that is, it does *not* give a sound corresponding with the key pressed down, but sounds a *fifth* higher: when the key c is put down, it gives the sound g. These '*fifth-sounding*,' or *Quint* stops, are of various lengths, a Quint of $5\frac{1}{3}$ feet, sounds a pure, or perfect fifth, above the 8 feet pipe; a Quint of $2\frac{2}{3}$ feet sounds an octave above the previous one, and is, in England, called the *Twelfth*; * a Quint of $1\frac{1}{3}$ feet, sounds an octave above the *twelfth*, and is called the *Larigot*, *octave* 12*th*, or 19th; † there is also a still smaller Quint sounding the *twenty-sixth*, but this is only met with in the Mixture stops: on the Pedal a Quint of $10\frac{2}{3}$ feet, sounds the fifth above the 16 feet C. Thus, the note CC, when the *Quint* stop of $5\frac{1}{3}$ feet is drawn, sounds *Gamut* G, the fifth above: with the $2\frac{2}{3}$ feet it sounds the little g (Fiddle g) an octave above: with the $1\frac{1}{3}$ foot it sounds the one-stroke $\bar{g}$ or $g^1$, an octave higher still.

*Q.* What particular names are applied by Organ builders to the different octaves of the Organ Clavier?

*A.* They are known by the following names:

* In Germany the *Duodecima*.

† In Germany the *Unvigesime*.

Top octave.
Treble octave.
Middle octave.
2-feet octave.
8-feet octave.
Bass octave.
4-ft. octave.
Tenor octave.
Double C
Gamut G
Tenor c
Fiddle g
Middle c
8 above middle c
Treble c
G in alt
c in alt

Some of these names are derived from certain instruments: thus, Tenor c is the lowest note of the Viola, or Tenor Violin: Fiddle g is the lowest sound of the Violin: Gamut G was the lowest note of Guido's scale or Gamut: sometimes, instead of the figures $c^2$, little horizontal lines are used; thus $\bar{c}$ or $\underline{\bar{c}}$; but the figures are less complicated. They are called the *once-marked* octave, the *twice-marked* octave, &c.

*Q.* As it is known that progressions of fifths, in harmony, are faulty and disagreeable, is not the effect of a Quint stop equally discordant?

*A.* The faulty progressions of fifths in harmony are not quite the same as the effect produced by a Quint stop, the sounds of which are, what are called *harmonic sounds*, and blend so well with the other stops, in all good Organs, that when used together they produce one full, brilliant, and magnificent tone.

The Quint stop affects only the *character* of the tone, and only produces discord when used in combination with weak 8 and 4 feet stops. The Quint requires a good Foundation tone of several 8 and 4 feet stops, and when a 2 feet stop is added, the effect is very full, for it imparts to the tone a particularly bright quality. One Quint stop, generally the *Twelfth*, is therefore found even in small Organs.

*Q.* What are the stops that produce other varieties of tone or of pitch?

*A.* These generally occur in the *Mixture*, or *Compound stops:* thus, the *tierce*, or *third-sounding* pipe, *when of 6⅔ feet,* sounds EE, a major third above the

8 feet CC; when of $3\frac{1}{5}$ feet it sounds a third above the tenor c, the 4 feet pipe; or, a *tenth* above the 8 feet pipe: when of $1\frac{3}{5}$ foot it sounds a third above the middle $c^1$, the 2 feet pipe, and a *seventeenth* above the 8 feet pipe.* The Minor 7th is found sometimes, although very rarely.†

*Q.* What is meant by *Mutation* stops, and *Mixture* stops?

*A. Mutation*, or *Filling-up* ‡ stops, are those which do *not* give a sound corresponding with the key pressed down, such as the Quints, Tierces, &c. The *Mixture*, or *Compound* stops, have more than *one* pipe, often *five*, to each key: and these are little pipes, so uniformly required to be used together, that they are made to draw in groups, and they impart much clearness and brilliancy to the general tone of the organ, which, with only 16, 8, 4, 2 and 1 feet stops, would be dull and monotonous, lacking brightness.

*Q.* In a large, powerful Organ, one sometimes hears prominent sounds of a *vibrating* and somewhat rattling nature; what are these sounds?

*A.* They are produced by the *Reed-stops*, or *Tongue-work*. The pipes of these stops are constructed in a particular manner (as will presently be seen), whereby the tone is rendered somewhat rough, or reedy; and also penetrating.

* The name Tenth, or Tierce; in Germany *Decima*; is applied to all these third-sounding stops.

† See the organ at St. Nicolai, Leipzig, Chap. 10.

‡ *See page 8.*

*Q.* Has every Organ such Reed-stops?

*A.* Small Organs very seldom have them, but those of 15 to 20 stops usually have one or more Reed stops, which enhance the relative power of the Organ.

*Q.* How are all these various stops employed, either singly, or in combination?

*A.* This is called the *art of Registering*, and requires much study, and great experience. In a subsequent chapter we shall return to this subject: at present we will take a glance at the interior of the Organ.

---

## CHAPTER III.

### THE INTERIOR OF THE ORGAN.

*Q.* What is the name of that part upon which all the pipes stand?

*A.* The *Sound-board*, a strong piece of oak, resting upon the *Wind-chest*, to which the wind is conveyed from the bellows by means of wooden tubes called *Wind-trunks*.

*Q.* Does an Organ contain only one Wind-chest?

*A.* Each Manual has its own wind-chest and sound-board, and there is also a separate one for the *Pedal. When there are many stops on the Pedal, there are sometimes several wind-chests*; and indeed

a single stop has occasionally its own particular wind-chest.

*Q.* In what order do the pipes stand upon the Sound-board?

*A.* Each Stop, or series of pipes, is placed in a row, according to the length of the wind-chest, so that the larger pipes occupy the middle, and the smaller ones follow on each side. The various stops, however, stand behind one another, so that in each stop the notes always stand behind the corresponding notes in the other stops on the sound-board. Thus, C in every stop is in a line, one C behind another.

It will be seen in Fig. 1 that C is on one side of the wind-chest, and C♯ on the other, the pipes following, from these, by *whole tones*, throughout the extent of the sound-board. That half of the sound-board on which the C stands is called the C side, and the other half the C♯ side. The sides are named after the lowest note on that half of the sound-board.

In some Organs this arrangement is reversed, the large pipes being placed outside, and the small ones in the middle.

In small Organs a third plan is sometimes adopted, the pipes of the "bass" * octave being placed on each side as above, and the remaining pipes in regular *chromatic* succession. This admits of a more simple kind of key-movement than the other methods.

* See page 9.

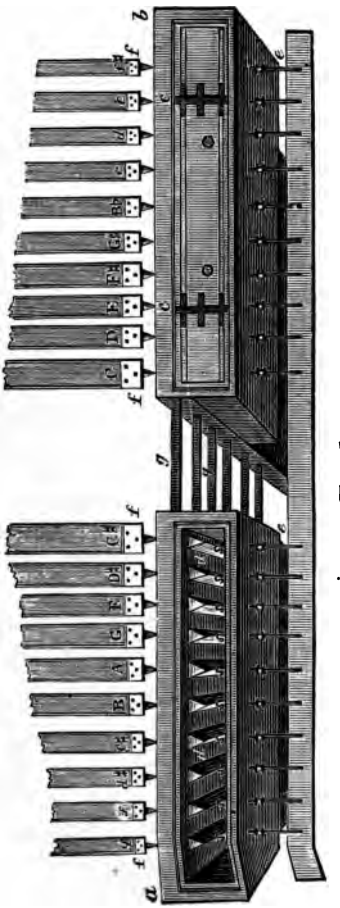

FIG. 1.

*a*, *b*, front view of part of a *wind-chest*:

*a*, represents the wind-chest open:

*b*, represents it closed by means of the *front-board*.

*c*, *c*, Bolts, that in many old Organs are used to close the front-board hermetically: in modern Organs screws are generally used. (*See* Fig. 2.)

*d*, *d*, Front view of the *sound-board pallets*, or *valves*, in the inside of the wind-chest.

*e*, *e*, *e*, *Trackers*, that by means of a *hook* connected with the *pull-down*, (a small piece of wire, under the pallet,) admit the wind to the pipes, by pulling down the pallet. The other end of the tracker communicates with the key, by means of other mechanism.

*f*, *f*, *f*, *f*, The first row of wooden pipes.

*g*, *g*, *Sliders* that lead from one part of the wind-chest to the other, and regulate the admission of the wind to, or the shutting it off from, the different pipes. These sliders communicate with the Register, or Stop handle, near the clavier, by means of mechanical apparatus, which will be explained further on.

*Q.* What are the *Sliders* which are seen at *g*, *g*, in Fig. 1?

*A.* They pass from one side of the Wind-chest to the other, under the foot of each pipe, and admit the wind to the pipes, or shut it off. Each Register has its own *slider*, which is connected with the stop handle by a system of mechanism called the '*draw-stop action*,' of which there are many varieties, suited to the exigences of particular cases.

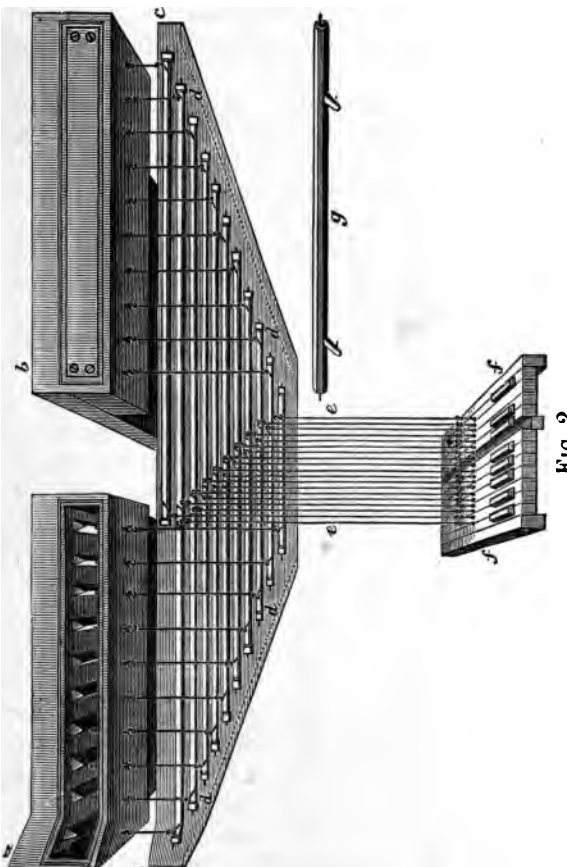


FIG. 2.

Fig. 2 represents the Keys, &c. of an Organ, and the mechanical apparatus of the Manuals.

*a*, *b*, is part of a divided wind-chest, one part open, the other closed.

*c*, *c*, is a *Roller-board*, upon which there are *Rollers* of various lengths. This *Roller-board movement*, as it is called, occurs in all organs in which the CC and CC♯ pipes are in separate halves of the sound-board; the pipes being, sometimes, a distance of seven or eight feet from one another, while the keys are side by side on the Manual: all the other pipes, as already shown, being arranged alternately right and left, while the keys, of course, proceed regularly upwards. In consequence of the order of the keys and the pipes not being the same, each key is generally furnished with a *roller*, and this leads to the use of a large number of rollers, the movement being named after them. The roller-board, on which the rollers are placed, is the large irregularly shaped board, or frame, that occupies much space under the wind-chest.

Each roller is provided with two *arms*—*g*,—one arm being immediately over the key, with which it is connected by a *sticker*; the other arm being directly under the pallet, with which it is connected by a *tracker*, through a little opening in the under part of the wind-chest.

*d*, *d*, *d*, *d*, the metal pins projecting from each end of the roller, and on which it moves.

*e*, *e*, the *stickers* reaching from the key to one of the arms of the rollers: *f*, *f*, a small part of the key-board: *g*, a roller with its two arms and pins.

*Q.* What is the difference between a *sticker* and a *tracker?*

*A.* A *sticker* is a round or square piece of wood, with a wire pin at each end, which is *stuck* into the key, or the *back-fall*, with which it is connected: a *tracker* is a strip of light wood, about $\frac{5}{16}$ of an inch in width, $\frac{1}{8}$ in thickness, and any length that may be required. A tracker is furnished at each end with a piece of brass wire, tapped like a screw, upon which is a bit of thick leather called a *button*, to secure it in its position: or, the one end may be furnished with a little hook, instead of the wire.

It is generally by means of a roller-board and its mechanism, that the pedals act upon the Manuals, and pull down the keys, when the Pedal coupler is drawn.

*Q.* What is a *backfall?*

*A.* Backfalls are made of hard wood, and of this shape

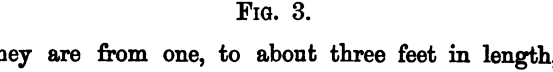


FIG. 3.

they are from one, to about three feet in length, according to the distance required: a small wooden frame—*a*—sustains them in their proper place, and a piece of stout iron wire—*b*—passes through the centre of each backfall. The wire at the end of the tracker *is passed through* a small hole in the end of the *backfall, indicated* by the dotted lines—c, c,—to which

it is firmly secured by the *button*. As the tracker raises the one end, the backfall moves on its centre, and the other end descends.

There is another kind of mechanism called the *fan-frame movement*, because the backfalls spread out in the form of a fan; it is more simple than the *roller-board* movement.

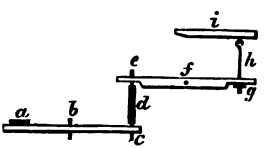

FIG. 4.

On pressing down the key *a*, which moves on its centre *b*, the other end *c* rises, and lifts the sticker *d*: this raises the one end *e* of the backfall, which, moving on its centre *f*, causes the other end *g* to descend, and draw down the tracker *h*, and this pulls open the pallet *i* and admits the wind to the pipe.

*Q.* What is a Pedal Coupler?

*A.* It is mechanism which either unites one, or all of the Manuals, to the Pedals; or it causes the Pedals to play in the octave, as well as in the unison: thus, one kind of octave Pedal coupler brings the CC pipe on to the CCC pedal: another kind, (double coupler,) brings the CCC pipe on to the CC pedal.

*Q.* Are there any other couplers?

*A.* There are three kinds of Manual couplers: the *Unison*, *Octave*, and *Double* couplers.

The *Unison* coupler unites any key of one Manual to the corresponding key of another. The most *usual coupler of* this kind is Swell to Great: large

Organs have also *Swell to Choir*, and *Choir to Great*, unison couplers.

An *Octave* coupler unites the Swell to the Great, by pulling down the Swell in the octave above,* or the octave below,† that key pressed down by the finger. Octave couplers are often found in Organs in Italy, where they are called *Terzo Mano*, third hand.

The *Diaocton* is a name sometimes given to an octave coupler, which draws down the octave above, on the *same* manual.

A *double* manual coupler unites one manual to another in the octave below, or sometimes a manual to itself in the same manner.

The Couplers do not always take down the keys, but sometimes act upon the pallets without moving the keys.

*Q.* What is the *Sforzando* coupler?

*A.* It is a movement for increasing the power of the Swell instantaneously, and is worked by a pedal, on pressing down which, the Great organ becomes coupled to the Swell: the action is disconnected on removing the pressure from the pedal.

In some large Organs a *sforzando* coupler unites the Solo Organ to the Great, in the same way.

*Q.* What is a *Tremulant?*

*A.* A contrivance that gives to the tone of any department of an Organ to which it may be applied, a waving or undulating effect, similar to the *vibrato*

* *This is* sometimes called a *Super-octave* coupler.

† *This is* sometimes called a *Sub-octave* coupler.

in singing, and the *tremolando* in violin-playing. The tremulants in old organs were very noisy contrivances; but the French organ builders devised a better kind of tremulant, which has been still further improved by the English builders.

*Schwebung; Waving*, is a lighter species of *tremulant*, for the more delicate stops, such as the Vox Humana, &c., to produce a very gentle oscillation in imitation of the wavering tone of a complaining human voice, in slow pathetic passages.

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## CHAPTER IV.

### OF THE PIPES, AND THEIR CONSTITUENT PARTS.

We will now consider the materials of which the pipes are made, and the single parts of each.

*Q.* What materials are used for the Pipes?

*A.* Tin; metal; lead; antimony metal; zinc; and different kinds of wood.

*Q.* Are the tin pipes of pure tin, or only a mixture?

*A.* Tin is best, in point of excellence, of all the materials used for Organ pipes; and English tin is the most valued, not only by English, but also by continental builders. Tin is light, very durable, and has a superior silvery colour, which does not soon become tarnished. Pipes of tin stand better in tune than those of other materials, on account of its greater

hardness, and its being less susceptible of change of temperature.

On account of its cost, tin is seldom used pure; but more or less lead is generally mixed with it: it is, however, still called tin if the mixture of lead does not exceed one-fourth of the whole. Pipes of this mixture are said to produce the greatest body of full and bright tone.

In the best Organs, English tin is generally used for the front pipes.

*Q.* What is understood by Metal pipes?

*A.* Metal is a technical name given by Organ builders to a mixture of tin and lead, and generally should mean half tin, and half lead.

A mixture is often used called '*Spotted Metal*,' from the surface being covered with spots, or mottled: it is considered good, and the spots appear if the ingredients contain about *one-third* of tin.

Lead, for Organ pipes, is of little value, as it is unable to sustain its own weight for any long period.

Antimony metal is a compound of lead and antimony, or lead and type, but it is very brittle, and liable to crack.

Zinc has sometimes been used for large metal pipes, and it is not much affected by alteration of temperature. Zinc pipes produce a rather lighter tone than those of tin or metal: its cost, being much less than that of good metal, is greatly in its favour.

*Q. What kind* of wood is used for the wood pipes?

*A.* For the large Pedal and Manual pipes, pine, or fir wood, free from knots; and for some of the smaller ones, cedar: in continental Organs, maple, pear-tree, box-wood, &c., are used; and in Organs intended for hot climates, mahogany is often used.

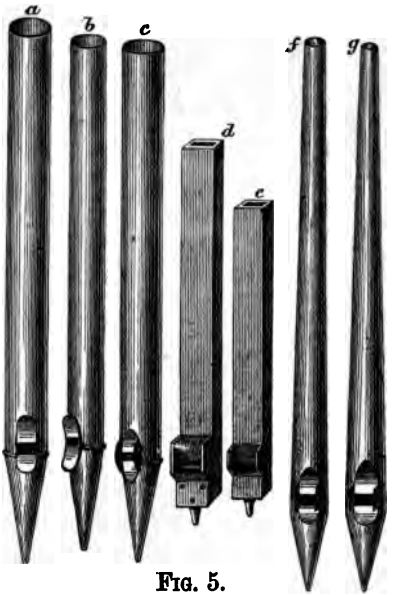

FIG. 5.

*Q.* What other peculiarities are there in the classification of pipes?

*A.* As regards the manner in which the tone is produced, they are divided into two distinct classes: *flue-pipes*, or *flute-work*; and *reed-pipes*, or *tongue-work*.

## I.—FLUE-PIPES.

The various forms of *flue-pipes*, or *flute-work*, are represented in Fig. 5. They are also called *Labial*, or *lip*-pipes; also Mouth-pipes, because they have an oblong opening, called the mouth,

at that part where the *body* of the pipe is joined to the *foot*: above and below are two edges called the *lips*; and between the lips is a flat piece of metal called the *language*, or *languid*: this is made thick and strong, and between the language and the lips is a narrow slit or *wind-way* for the current of air to pass from the foot to the body of the pipe. The shape of the *language* or *languid* is shown in Fig. 6, *a*, it is soldered horizontally at the top of the foot *b*, just inside the mouth.

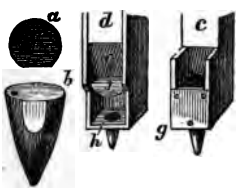

FIG. 6.

The size and proportion of the mouth exercises great influence on the quality, character, and strength, of the tone. A wide, high mouth, gives a round, powerful, tone; a narrow mouth, a more acute tone; a narrow, low, mouth, a delicate tone; and if the mouth is very wide and high, the tone is hollow and less clear: but there are limits to these variations; for if the mouth is too narrow, the pipe will speak an octave above the proper sound; and if the upper lip is cut up too high, the pipe will either be slow in speaking, or will not speak at all.

*Q.* What do you mean by the *body*, and the *foot* of the pipe?

*A.* The *body* is that part of a metal pipe, which beginning at the mouth, extends upwards in a cylindrical form (*Fig. 5, a, b, c*); or, in some pipes, of a conical

form (Fig. 5, *f*, *g*): at the lower end—the mouth—a part of the pipe is flattened, or bent inwards, and a small portion of the flattened part is cut away, leaving a long opening, the edge of which is called the *upper lip*.

The *foot* is the bottom part of the pipe, of an inverted conical shape, extending from the mouth downwards (Fig. 5) with a flattened part corresponding with that in the body of the pipe, and which forms the *under-lip* (Fig. 6, *b*). The foot conducts the wind from the sound-board to the mouth of the pipe: and it is made very thick and strong, that it may support the weight of the body of the pipe. There is a small hole at the bottom of the foot, for the entrance of the wind from the sound-board.

The gravity, or acuteness, of the tone of the pipes, depends chiefly upon the length, or shortness, of their *bodies*.

*Q.* What is the form of the wood pipes?

*A.* A wood pipe consists of the *body*, *block*, *cap*, and *foot*.

The *body* consists of four smooth boards, and is either square, or nearly so, giving a full, weighty, tone; or, narrow and deep, producing a soft and sweet (*Lieblich*) tone; or, shallow and wide, giving a powerful and hollow (*Hohl*) tone.

The *cap* (Fig. 6, *g*,) is a piece of hard wood at the lower end of the pipe, covering the *block* (Fig. 6, *f*): the *block* performs the same office as the tongue in the metal pipes. The *foot* is a tube introduced at

the bottom of the pipe; it serves as a support, and also as a conductor of the wind into the pipe. At Fig. 6, *e*, is the upper-lip; *c*, *d*, the body of the pipe; *h*, the tube or foot where the wind is introduced; and the space between *f* and *h* is called the *throat*; this, with the block, is closed in front by the *cap*, *g*, which is either screwed or glued on.

*Q.* How is the tone produced in a flue-pipe?

*A.* The air passes up the *pipe-foot*, rushing through the *wind-way*; there the stream of air separates, one part going forth freely out of the pipe, the other part strikes against the upper lip, and this concussion causes the air in the body of the pipe to vibrate, and thus the tone is produced in both wood and metal pipes.

*Q.* What is the meaning of an *inverted mouth?*

*A.* Wood pipes have, occasionally, their mouths inverted; that is, the sloping part which forms the upper lip is bevelled off the *inner* surface of the front part of the pipe, instead of the outside, and the front of the *block*, (instead of being in a line with the inner surface, as in the case of wood pipes of the usual kind,) projects forward as far as the *outer* surface of the front of the pipe: a pipe with an *inverted mouth* presents the appearance as if there were no upper lip at all. The arrangement of the mouth being completely reversed, as compared with other wood pipes.

*Q. What are pipes with double-mouths?*

*A. They are not often seen in England.* The

pipe has *two mouths*, instead of one: the mouths being placed on opposite sides of the pipe. Pipes of this species are said to have greater strength of tone. The German 'Doppel-flöte' has pipes with two mouths.

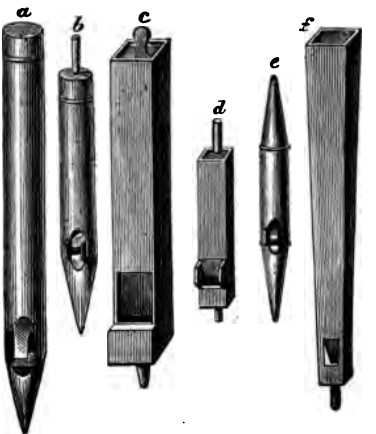


FIG. 7.

Flue-pipes both of wood and metal are often furnished with *ears*, that is, pieces of metal or wood projecting from each side of the mouth: they have also occasionally a *beard*, which is a cross-piece fastened on just below the under-lip. *Ears* and *beards* are generally put to pipes of slow speech, because, by keeping the wind more together and allowing less to escape, the pipe speaks more quickly. *Stopped* and *half-stopped* pipes have larger ears than *open ones.* Ears and beards of various forms are seen upon the wood and metal pipes in Figs. 5, 6, 7.

## Stopped Pipes.

*Q.* What are Stopped Pipes?

*A.* Stopped, or *covered* pipes as they are sometimes called, are such as have their top covered or closed by a *cap* in metal pipes, (Fig. 7, *a*) : or, a *stopper* or *plug* in wooden ones, (Fig. 7, *c*). In England metal pipes covered with a cap are rarely met with, but they are common in Germany under the names of *Gedackte* (or *Gedeckte*), and *Quintatön*. (See Chap. 9.) Stopped wooden pipes are much used in most Organs, both English and Foreign.

There are also *half-stopped* pipes, which have in the *cap* or *stopper* a small tube, or chimney, and hence called, in France, *flûte à cheminée* (Fig. 7, *b*). Metal stops of this kind are often seen in old Organs, and occasionally in modern ones. In Germany the name *Rohr*, (reed, or pipe,) is applied to them: *Rohr-flöte* meaning, a stop belonging to the *flute*-work, the pipes of which are furnished with a tube or *reed*: referring, not to the character of its tone, but to the pipe or small tube resembling the hollow stalk that grows in marshy places, and which is called a *reed* (*rohr*). The tone of these stops with chimneys is very smooth and liquid. In wood pipes the stopper has a hole drilled down through it (Fig. 7, *d*).

The stopped wooden pipes are generally made four-square, or nearly so: sometimes a different quality of tone is produced by making them either narrow and *deep, or shallow* and wide.

*Q.* What influence has the stopping of a pipe upon its tone?

*A.* It affects both the *pitch*, or *acuteness* of the tone, and also its *character* or *quality*. The tone of a Stopped pipe is about an Octave deeper than an Open pipe of the same length, because the column of air in the body of the pipe, when in vibration, instead of escaping at the top, is checked by the stopper, and returns back down the pipe to the mouth, to make its exit. It thus travels the length of the body twice over, first up, then down; and consequently produces a sound of increased gravity. The CC note, or tone, therefore, is produced from a stopped pipe of only 4 feet in length, instead of 8 feet;* and a stopped pipe of 8 feet produces the 16 feet tone. In this manner, it is possible, from a stopped-pipe of 16 feet, to produce, in many cases, the 32 feet-tone.

The quality of tone of the stopped pipes is soft and mellow, while that of the open pipes is clear and strong.

*Q.* Are there any other varieties of the *flue-pipes?*

*A.* Some stops have the pipes perforated with a small hole near to the top, such as the *Keraulophon:* the pipes of the English *Hohlflute* have two holes, opposite to each other: and those of the *Flûte Harmonique* have a hole about half way up the body.

In Germany cylindrical pipes are made of wood, producing a most exquisite tone: such is the *Flauto Traverso.*

* *The pipe is* consequently described as producing the *-feet tone.*

There are also conical pipes, the bodies of which are more or less pointed at the top, (Fig. 5, *f*, *g*,) as the *Spitz-flöte*, or *Pointed-flute;* and the *Gemshorn.* Conical pipes, surmounted by a bell, or out-spreading top, are used in the *Viol-di-Gamba.* Pipes of the inverted conical shape—narrow at the bottom, and wider at the top, are used in the *Dolcan* stop. (Fig. 7, *f.*)

*Measure, or Scale, of the Pipes.*

*Q.* What is understood by the *measure*, or *scale*, of the pipes?

FIG. 8.

*A.* The proportion of the *width* of the pipe, to its *length.* The width has no influence upon the *acuteness*, or *pitch*, of the tone, as the length has, but it influences its *character* or quality of tone. In a pipe of *wide measure* the tone is full, vigorous, and powerful; *narrow measure* gives a striking, clear, tone. We shall notice this circumstance in speaking of the stops singly.

II.—REED-PIPES.

*Q.* Describe the form of a *reed-pipe.*

*A. The tube* * (or *body*) of the pipe is either

* *In a reed-pipe it* is called a *tube*, in a flue-pipe the body.

cylindrical (Fig. 8, *c*, *d*): an inverted cone (Fig. 8, *e*): an inverted cone with a bell (Fig. 8, *a*): or an inverted wood pyramid (Fig. 8, *f*). The *tube* rests upon the *block* (Fig. 8, *a*, *b*, *c*, *d*, *e*, *f*, also Fig. 9, *a*, *a*), to which it is soldered, in small metal pipes; but in the larger pipes it goes into a socket which sustains it firmly and steadily.

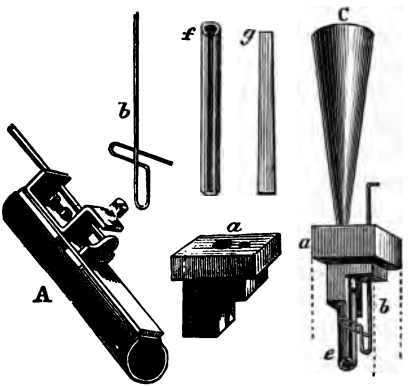


FIG. 9.

In old German reed pipes the blocks were often of box-wood, turned in a lathe: in modern English Organs the block is a solid mass of metal, cast in a mould; and usually of a circular form (see Fig. 8, *a*, *b*, *c*, *d*,); but in German Organs it is of a square form, as in Fig. 9, *a*, *a* (see also Fig. 8, *e*, *f*).

*In the block* are two round holes (Fig. 9, *a*), one of

which receives the *reed*,* (Fig. 9, *e*,) which is a small cylindrical brass tube, with an opening, as though a portion of one side were cut away: it is usually a little wider at one end than the other, and closed at the lower end (Fig. 9, *f*): and also the *tongue* (Fig. 9, *g*), which is placed immediately over the opening in the reed, and fastened with a small wooden *wedge*. The smaller hole admits the *tuning-wire* (Fig. 9, *b*, *b*). The reed and the tongue hang suspended from the block, into which they are tightly fixed, see Fig. 9, *e*, representing the reed, with the tongue, fixed by a wedge at the top, and the tuning-wire pressing upon the tongue.

The block fits into and rests upon the *boot*, which is, in German Organs, of a square form, and of wood, see Fig. 8, *e*, *f*: in English Organs the boot is a strong tube of metal, see Fig. 8, *a*, *b*, *c*, *d*. The boot supports the weight of the entire pipe, and rests upon the sound-board; it receives the wind through a hole at the lower end.

In producing the tone, the tongue, which is slightly curved, *strikes upon*, or *against*, the reed, and the pitch of the note is regulated by the *tuning-wire* (Fig. 9, *b*, *b*), which is hooked at the upper end, so that the tuning-knife may the more readily move it upwards or downwards: the lower part of it is bent up, that it may press the tongue against the reed, and permit a larger or smaller portion to vibrate. When

* The word *rohr* or reed being applied by German Organ *builders to some of* the stopped flue pipes (see page 28), the *Reed stops are sometimes* named *Tongue* stops.

the wire is not hooked, as in Fig. 8, *e*, *f*, it is moved up and down with a pair of nippers, or pincers.

These are called *striking* reeds; and when the reed is *open* all the way up, as in Fig. 9, *f*, it is called the *open reed*. This has always been in use. When the space in the reed is partially covered or closed, it is called the *closed reed*. There is also a third species called the *free-reed*, the tongue of which, instead of striking on the edges of the reed, as in the others, is driven *into* the opening by the wind, resuming its former position by its elasticity, and the sound is produced by its rapid vibrations to and fro, as in the Harmonium and the Physharmonica. The free-reed is quite a modern invention.

The *closed* reed is by some supposed to produce a more subdued tone than the *open* reed: the tone of a *free*-reed is particularly smooth, and free from rattling, but it is not usually so strong and vigorous as that of the striking reeds. The edges of the open reed are sometimes covered with leather, to prevent the tone being too rough and rattling.

The position of the *striking* reed and tongue is shown more distinctly at A, Fig. 9; and upon the tongue of this may be seen another kind of *tuning-wire*, or *crook*.

At Fig. 9, C, the whole apparatus is shown complete: formerly many of the parts were made entirely of wood, now they are of metal, and there are many varieties. The dotted lines show the form of the boot, which covers the whole.

*Q. How is the* tone of the Reed-work produced?

*A.* By the opening of the Pallets in the wind-chest, the wind is driven into the boot, and finds there an outlet in the little orifice between the reed and the lower end of the tongue, which is slightly curved: thus, the tongue is set in vibration, and produces the sound, which issues through the reed into the tube or body of the pipe.

*Q.* Are there other differences in the construction of the Reed-pipes?

*A.* As before stated, the *pitch* of a reed-pipe depends upon the reed and the vibrations of the tongue: but the *quality* of the tone is much influenced by the form, scale, and material of the tube: short cylindrical pipes, as the *Clarionet* or *Vox Humana*, give a comparatively light sound: tubes of the inverted conical shape are more sonorous, the strength and character of the tone being somewhat influenced by the scale and length of the tube. If the tube is of narrow measure the tone is rather thin and nasal, as in most *Bassoon* stops: if to a narrow tube, a bell is added (Fig. 8, *a*), the tone is rather clearer, but somewhat wailing and attenuated, as in the *Oboe* stop. Further increase in the scale gives more weight and power in the tone: the *Trumpet* being brighter and louder than the *Bassoon*, and the *Posaune* more ponderous than the *Trumpet*.

The quality of the tone depends, also, much on the shape of the opening in the reed, and the smoothness and flatness of its edges: upon the thickness of the *tongue; its curvature*; whether it is made of com-

mon brass, or with an intermixture of copper. The tongues of the Oboe, Clarionet, and Bassoon, are long, thin, and narrow: those of the Trumpet, and others, are shorter, thicker, and broader.

Some Reed-stops have pipes *half-stopped* at the top.

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## CHAPTER V.

### OF THE WIND-CHEST.

*Q.* What is a wind-chest?

*A.* A long, broad, and rather shallow, wooden box, or case (Fig. 1, fig. 2, and fig. 10), of the same length as the *sound-board* above it, to which it belongs: and, in modern Organs, nearly as broad. In old Organs, the wind-chest was often about *one-fourth* of the breadth of the sound-board. See Ch. 3.

The exterior form of the wind-chest has been already represented, Ch. 3, Figs. 1 and 2. We will now explain the interior: see Fig. 10.

*a, a,* the *pallets,* or *valves,* with their *pull-downs.*

*b, b,* the *channels,* or *grooves,* running across the entire wind-chest. Each key has a small *groove* specially provided for it, corresponding to the pallets in the wind-chest. When the key is put down it pulls open the valve, and this lets the wind into the groove; if the *slider* be drawn out the wind goes direct into the pipe.

*c, c, c, the table,* extending over the grooves.

*d, d, d, d, d, d, d, d, d, d,* the *sliders*, leading right and left, and communicating with the stop-handles near the keys.

*e, e, e,* the *bearers* between the sliders. The sliders are moveable, and the *bearers* are fixed, to keep the sliders in their places, and also to support the *upper boards*, and the pipes above.

*f*, the *stop-peg*, a stout iron pin, which is fixed into the table, and allows the slider to be moved just sufficient to cover, or uncover, the holes in the table.

*g, g*, the openings from the grooves for the *mixture* stops: in this mixture stop there are, as will be seen, 3 pipes for each note, and the one large opening in the table supplies the wind for the three pipes.

*h, h, h, h, h,* the *sound-board*, on which the pipes are placed. It is made in several separate pieces, for the convenience of removal: each stop having a separate board.

*i*, the *holes* in the table: showing the places for the pipes of each stop. These holes correspond with those in the *sliders*, and in the *sound-board.*

*k*, the holes for the pipes of the mixture stops, bored across, and connected with the openings *g, g.*

*l, l, l,* the *pipe-racks*, which are 4 or 5 inches above the sound-board, and support the pipes in an erect position (see Fig. 11). The large pipes are supported by hooks, or handles.

*m*, *rack-pillars*, supporting the *rack-boards.*

*n*, a pipe in its position.

*Q. Explain further about the sliders.*

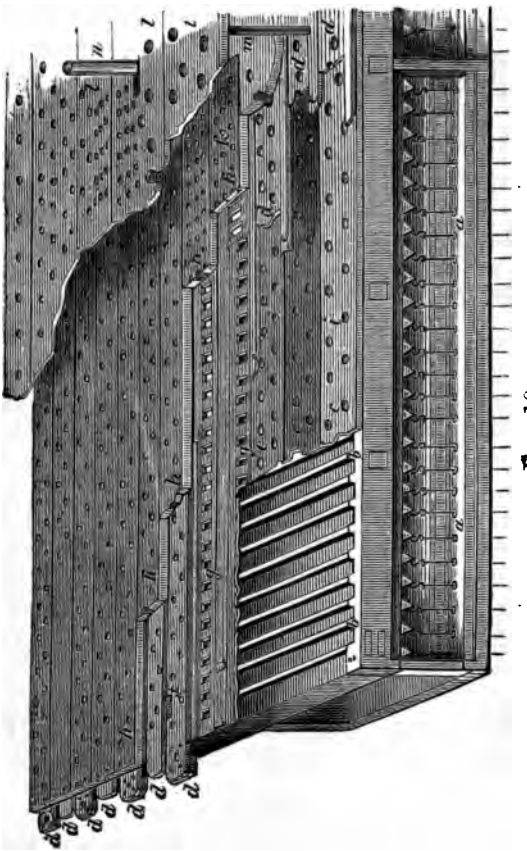

FIG. 10.

*A.* Each of these sliders is pierced with holes, exactly corresponding with those in the *table* under it, and with those in the *upper-board* above. On drawing the slider a little way out, by means of the *stop-handle*, the holes are brought exactly *over* those in the table, and therefore directly *under* those in the upper-board. The three series of holes now agreeing, the air can pass up, through all of them, from any groove, or channel, into which it is admitted, into the pipe immediately above, thus making the pipe to sound.

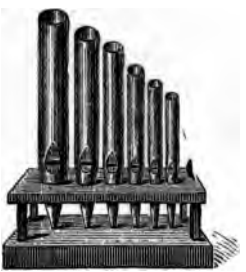

FIG. 11.

By pushing in the stop-handle, and thus moving the slider back, the holes in it are removed from the corresponding holes in the table and in the upper board; the blank part of the slider being substituted for the holes; and the wind now having no outlet, is checked by the blank part of the slider, and thrown back into the groove.

Each slider controls a separate stop. The hole at the end of the slider is intended for the *lever* by which the slider is moved to and fro.

Immediately under the sliders is the *table* (Fig. 10, *c*, *c*, *c*), which covers the channels, or grooves.

*Q.* How is a *pallet* formed?

*A. Sound-board* pallets are long and narrow pieces of wood, of a triangular shape. (Fig. 12, *a*, *a*.) One

side of each pallet is covered with two or three thicknesses of leather, and laid against the pallet-hole, to cover it, and exclude the air from the groove. The ends of the pallet, as well as the sides, are bevelled off; at the one end the pallet is attached to the sound-board, by glueing a piece of leather as a hinge, which is further secured by a piece of wood fastened over it, or, in old Organs, a strong brass pin (Fig. 12, *b*). Underneath the front part of the pallet is a *hook*, to which is attached the *pull-down*, a

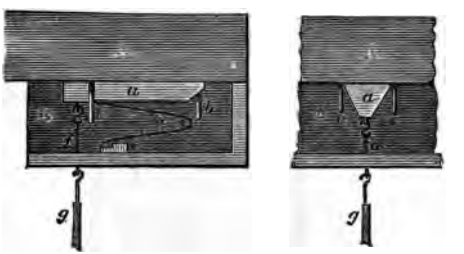


FIG. 12.

small piece of wire (Fig. 12, *f*), connected with the tracker by another hook (Fig. 12, *g*); and which, by pulling the pallet down, or open, admits the wind to the pipes. To ensure the pallets keeping their proper course, there are two pieces of wire, one on each side, called *direction pins* (Fig. 12, *c*, *c*, *c*): these prevent the pallets turning while in motion. Underneath the pallets a spring of brass or steel wire is inserted, (Fig. 12, *d*,) to ensure the pallets closing firmly against *the pallet holes*: the upper shank of the spring is

stuck into a hole in the pallet, the lower shank goes into a ledge of wood (Fig. 12, *e*,) fastened to the bottom.

As the *pull-down* goes through a hole in the bottom of the wind-chest, a plate of brass is fixed outside, through which holes are drilled just sufficiently large to allow of the *pull-downs* working through them freely, without any escape of wind. In old Organs a little pouch of leather was used, through which the wire passed.

*Q.* How are the pipes in the *front* of the case, or, 'in prospect,' as the Germans say,—supplied with wind from the wind-chest?

*A.* By means of pipes of metal, tin, or wood, called *conveyances*, which carry the wind from the

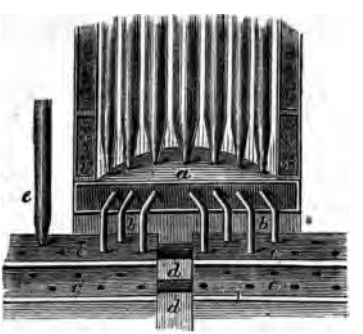


FIG. 13.

sound-board to those pipes at a distance; and which *are thus* said to be 'conveyanced off.' (Fig. 13.)

*a, the back* part of the *front* pipes.

*b*, *b*, *conveyances* from the wind-chest to the front pipes.

*c*, *c*, *c*, *c*, parts of a divided wind-chest.

*d*, *d*, *sliders* passing through from one part of the wind-chest to the other.

*e*, position of a pipe in the inside, upon the wind-chest.

There is another form of the wind-chest which appears to be used in Germany, though not in England. It is called a *Kegellade* (cone-box). A small cone, or pallet of a conical shape, is used, which admits, and shuts off, the air leading to the pipes (Fig. 14). There are no *sliders*, but each stop has its

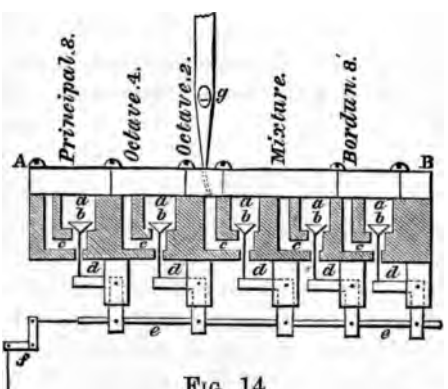


FIG. 14.

separate wind-chest, and every note of each stop its separate *Kegel* or cone-shaped pallet: and it is worked by *means of* a stop-handle.

A, B, the sound-board.

*a*, *a*, *a*, *a*, *a*, wind-chests, or wind-chambers, filled with air by the pressure of the bellows.

*b*, *b*, *b*, *b*, *b*, *Kegel*, or *cone*, or pallet, of a triangular shape.

*c*, *c*, *c*, *c*, *c*, channels for the air, leading from *a* to the pipes.

*d*, *d*, *d*, *d*, *d*, *squares*, connecting the cone or pallet with

*e*, *e*, coupling movement for all the squares.

*f*, *square* and *tracker* leading to the keys.

*g*, position of a pipe upon the sound-board: the dotted lines show the channel or course for the wind.

By pressure upon the key the *squares f*, and *d*, turn upon their pivots, and the *cone*, *b*, is raised up; the wind then rushes to the pipe through the channel *c*, and continues as long as the pressure upon the key.

*Q.* What is a *square?*

*A.* Squares are so many centres formed of some tough wood, or of iron, and are each furnished with two arms, about 3 inches in length. The *angle* of each square is placed in a corresponding cutting made in the *square-frame*, and the squares are held in their proper positions by a metal rod or pin, on which they move freely to and fro. See Fig. 14, *d*, *f*.

*Q.* What is a *Spring-chest?*

*A.* Like the wind-chest with sliders, a *spring-chest has grooves* and pallets; in place of the sliders, *however, a little* valve is put in for each note or key

of the single and compound stops, which is acted upon by means of the stop-handle. The *spring-chest* is only rarely met with, and in very old Organs. In later times alterations have been made in their construction. They appear, like the *Kegellade*, to be peculiar to Germany.

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## CHAPTER VI.

### OF THE MANUALS, AND THEIR CONNEXION WITH THE WIND-CHEST.

*Q.* What is the difference between the Manual of an Organ, and that of a Pianoforte?

*A.* In the Organ there are not only fewer octaves on the key-board, but also more *claviers*—Manuals,—which are placed one above another; and in the inside the mechanism is altogether different.

The keys are placed upon the *key-frame:* and in the inside reach to a considerable distance, by means of *stickers*, *trackers*, *backfalls*, &c.

*Q.* What are the mechanical parts connecting the claviers with the *wind-chest?*

*A. Rollers*, *Roller-boards*, *Trackers*, *Backfalls*, and *Squares*, which have already been mentioned (see pages 17, 18, 19); and it is now proposed to show, as much as practicable, their connexion with one *another: see* Fig. 15.

*a*, the *key*, from which projects, nearly in the middle, but not quite so, a *tapped-wire*, or winding-screw, behind the front board.

*b*, the *tracker*, at the end of which is a piece of wire with a *loop*, which goes on the *tapped-wire*, and is fastened by a leather button: by which also the *position*, or *elevation* of the key is regulated.

*c*, wire pin at the end of the key.

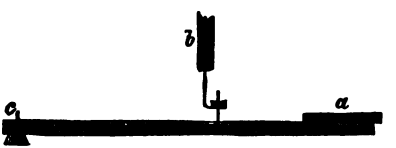


FIG. 15.

The *tracker* goes upwards to the arm of a *roller*, the second arm of which has another tracker, that leads up to the corresponding *groove* of the wind-chest, (see page 16). If the wind-chest lies more distant, as occurs very frequently in the Pedal, *squares*, or *backfalls*, and more *trackers* are required until the wind-chest is reached. The arrangements of the trackers, &c., are very various, according to the space allotted.

In the Pedal clavier a different mechanism occurs: the *pin* on which the pedal key moves, and which holds it in its place, is at the end of the key under the Organ bench. The pins are protected by a *ledge*. *(Fig. 16.)*

*a*, a Pedal key.

*b*, *c*, a *square*, or angular piece of mechanism, behind the front-board, moving on a centre, and placed in a corresponding cutting or socket made to receive it. Over the *fore-shank* of this lies the end of the key, which presses it down. There is leather used here, and in other parts of the mechanism, to prevent the rattling.

*d*, *d*, a rather strong *tracker*, connected with the *square*, by a *tapped-wire* and *button*, at *c*.

*e*, a second *square* with *tracker* leading upwards to the pallet in the Pedal wind-chest. The strength of this pallet and its spring, as in the manuals, lifts the key upwards when it returns into its position; but there is also a spring under the pedal key, to facilitate and secure this.

*f*, a tracker leading to the coupler *Manual to Pedal*, and connected with the stop-handle.

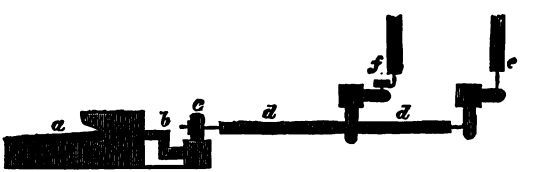


FIG. 16.

There are various other modes of coupling the Manuals with the Pedals.

*Q.* Is the connexion of the Claviers with the *wind-chest*, always in this manner?

*A.* Yes, in the main-point: but in old German Organs other methods are sometimes seen.

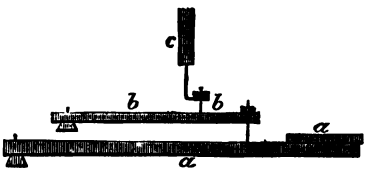


FIG. 17.

*a*, *a*, a key, connected by means of a *tapped-wire* and *button* with

*b*, *b*, a *second*, or *false* key, from which

*c*, a tracker goes upwards, secured by a tapped-wire and button.

All the other part of the mechanism as usual, leading by *squares*, &c. to the corresponding *rollers*. This is called a *blind-key*, or lever (*balance-clavier*): the position of the key was supposed to be better secured; and the key to have a lesser fall.

There is also another method, called in Germany the *Kepp-clavier*, in which the *pin* is not put at the back end of the key, but in the *middle* of it; thus, the back part of the key is raised, and moves the tracker. Similar to the *fan-frame-movement*, see page 19.

In England the *Roller-board* movement, and the *fan-frame* movement, are those most commonly used: see pages 16 and 19.

*Q. What is the Back-positive?*

*A.* In England this is called a *Choir Organ*, and stands at the *back* of the Organist, and in the front of the Choir-screen in a Cathedral or Church: the pipes and wind-chest of the *back-choir* are thus brought near to the singers in the choir, but the keys are placed in the usual position, near the Great Organ Manual, the mechanism being carried under the floor. This is the usual and proper position of the Choir Organ in Cathedrals, &c.; and it will be seen that it lies somewhat lower than the Great Organ.

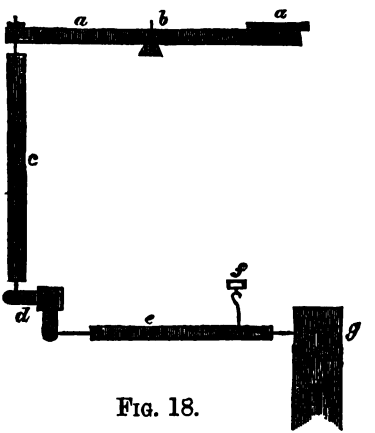


FIG. 18.

*a*, *a*, a *key*, with

*b*, a *pin* placed in the middle, and on which it moves.

*c*, a *tracker* leading downwards, which, by the *pressure upon* the key above, is drawn up.

*d*, a *square*.

*e*, a *tracker* under the floor, and which reaches to the *pallet*.

*f*, the place where the tracker *e* is suspended from the floor, and kept in its position.

*g*, *vertical pallet* in the *wind-chest*; showing the *pallet*, *spring*, and *pull-down*, placed perpendicularly, not horizontally.

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## CHAPTER VII.

### OF THE REGISTERS, OR STOPS.

*Q.* The different stops have been already alluded to; give some further information respecting them.

*A.* They are divided into—

1st. Those which belong to, and act upon, the various ranks of pipes.

2nd. Those which act as couplers, combining one manual with another; or, the manuals with the pedals.

3rd. Those called *Wind-valves*, or *ventils;* which open, or shut off, the wind.

4th. Those which serve for any other particular purpose.

Each of these has its own especial mechanical arrangement, which, in a great measure depends upon the space and locality, and also upon the skill of the *Organ builder.* If the *wind-chest* is a divided one, it *requires the sliders* also to be divided, and as the two

halves of the *sliders* must move simultaneously, they are connected by means of a *coupling-ledge*, and this is moved to and fro by means of a strong *lever*.

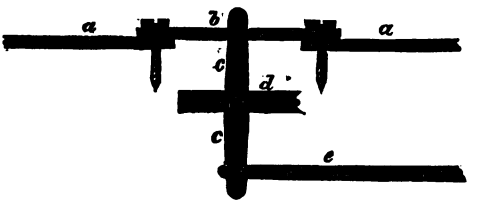


FIG. 19.

*a*, *a*, the *sliders* running to each side of the divided wind-chest.

*b*, the *coupling-ledge*, joined with the sliders by *screws*: in a notch is placed the upper end of

*c*, *c*, the *lever*, connected at its lower end with the *pusher*, *e*.

*d*, a *socket* in which the *lever* rests.

*e*, the *pusher*, which is connected with the stop-handle.

If the wind-chest is not divided the sliders are moved to and fro by means of a *lever* which works in a hole at the end of the *slider*, as mentioned on page 38.

*Q.* How is the *coupling* of the Manuals effected by means of the *stop-handles*?

*A.* These *stop-handles* are called Manual and Pedal couplers, and by them *two*, *three*, and *four* Manuals can be coupled together. In old Organs the *Manuals themselves* were moved backwards and for-

wards, but now this coupling is effected by means of *stickers*, and other mechanism, without moving the Clavier: and thus the coupling can take place *during the playing*, which formerly was not the case, without injuring the mechanism. In the old method, when the Manual itself was moved, it was by means of a knob on each side, requiring the two hands to pull them out, or push them in. The mechanism of the modern couplers is very various. When two, three, or four manuals are coupled, they can each be used separately, as if the couplers were not drawn.

*Q.* What is a *Ventil*, or *Wind-trunk* * *valve?*

*A.* It is a valve in the wind-trunk for shutting off, or stopping, the wind, from certain stops in the manuals or pedals, and thus making them silent; and avoids the necessity of pushing in all the stops by the composition pedals, which, from some imperfection in the mechanism, or some little irregularity, often act badly, and produce a disagreeable *howling*, or humming effect.

The Pedals have often two or more of these *ventils*, and in Organs of very large size each Manual has often two or more: the stops are then arranged in convenient *divisions* or *groups*, so that, in case of any accident to the mechanism, another group of stops may be available.

Each wind-valve is worked by means of a stop-handle, or by a *treadle* for the foot: see the Organ at *St.* Nicolai Church, Leipzig, Chap. 10.

* *In Germany* called a *Sperrventil*—shutting-off valve.

*Q.* What are the stops of the fourth species, as mentioned on page 48.

*A.* These are for various purposes, such as the *Tremulant* (see Chap. 3, p. 20): the *Bellows-bell*: in old organs there were also stops which acted upon the figures at the top of the case; such as, the Angels blowing their trumpets; Suns turning round; Moon and stars; Chimes; Nightingales, Cuckoo, and other singing birds. These are all excluded from modern Organs, with the exception of the *Tremulant* and *Bellows-bell.*

*Q.* What is the Bellows-bell?

*A.* A bell near to the bellows-blower or *bellows-treader*, moved by a stop-handle near to the Organ-player, and intended to give the signal when to blow, or to cease blowing.

All these stops are distinguishable by means of their inscriptions, which formerly were placed over or under the stop-handles, but in modern Organs the name is engraved upon the handle itself; and the stops of each clavier are grouped separately, and are generally distinguishable by the engraved letters being of *different colours.*

## CHAPTER VIII.

### OF THE BELLOWS, WIND-TRUNKS, AND THEIR CONNEXION WITH THE WIND-CHEST.

*Q.* How are the pipes made to sound by means of the wind?

*A.* The wind is gathered by the bellows and pressed forward through the wind-trunks into the wind-chest, ready for expulsion and dispersion through the foot of each pipe.

*Q.* Where are the Bellows placed?

*A.* In small Organs they are usually placed inside the case, or in close proximity to it; in larger instruments they are often in a space behind, or under the Organ, or even over it.

*Q.* Are there different kinds of Bellows?

*A.* In England two kinds are used, the *diagonal*, and the *horizontal* bellows. In very old Organs the bellows were similar to those still used in smiths' forges; afterwards *diagonal*, or *wedge-shaped* bellows came into use, these were an improvement upon the others, and continued in almost exclusive use until the latter part of the last century, when the *horizontal* bellows seemed to present so many advantages over the other, that the English Organ builders in the early part of the present century abandoned the *diagonal bellows for* the horizontal.

*The diagonal* bellows are of German Origin, and

are still much used in that country: but French and English Organ builders only use the horizontal bellows.

The principle of each of these two kinds of bellows is sufficiently indicated by the names given to them. The diagonal bellows is thus named, because the top rises *diagonally* when it is blown; one end ascending while the other is stationary. Many specimens are still extant amongst our old church organs. In small organs *two* diagonal bellows at least were necessary, one to supply the instrument, while the other was being replenished: many larger organs having 6, 8, 10, or more. They were usually placed side by side, sometimes outside the case, often in two rows, one over the other: the upper row being generally furnished with ropes, by which the same blower was able to work both rows; walking leisurely along the platform where the bellows were, he would press down the handles of the lower row, and in returning, draw down the ropes of the upper row. In many Continental Organs the inflation of the bellows is by *treadles* instead of handles, and hence the name 'bellows-treader': the blower steps from one treadle to another, depressing each by his weight, and thus distending the bellows. The wind is received into a chief wind-trunk, from which it is distributed amongst the several wind-chests.

The Horizontal bellows were first used in England by Samuel Green, about 1785, and they appear to be his invention. This Bellows always preserves the *horizontal* position, whether full, or empty, or at

any point between the two, and hence its distinctive name. A horizontal bellows will supply wind, with ease, to an Organ that would perhaps require half-a-dozen diagonal ones.

*Q.* What is a wind-trunk, and how is it formed?

*A.* A wind-trunk is a four-cornered, air-tight, channel or tube, made of stout boards; and it serves to convey the wind from the bellows to the several parts of the Organ.

When diagonal bellows were used, only one wind-trunk, or principal canal, was required to convey the wind to the Great organ wind-chest, from which other small canals branched out to the *choir*, and *echo*. When the horizontal bellows were introduced a separate wind-trunk, proceeding direct from the bellows, was also introduced for each wind-chest; and the modern style of playing being much *fuller* than the old style, and the pedals being freely used, a larger supply of wind is required on each clavier.

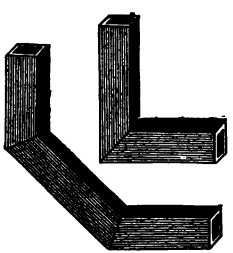

FIG. 20.

The size of a wind-trunk depends upon the distance of the sound-board from the bellows, the number and size of the stops to be supplied, &c.: and its course is either direct to the wind chest, or *one or more* joints, or *Knees* are required, see Fig. 20. *As the pipes speak* more promptly when the sound-

board is not too far from the bellows, the wind-trunk is always made as short as possible.

*Q.* How is the strength or pressure of the wind regulated, or fixed?

*A.* By means of iron slabs which are placed on the top of the bellows, to compress the wind. The precise amount of weight to be used depends partly on the size of the bellows, and partly on the *strength of wind* required.

*Q.* How is this determined?

*A.* By the aid of a little machine called a *wind-gauge*, or *anemometer*: and the process is termed 'weighing the wind.' The anemometer is a small curved glass tube into which a little water is poured, and it is then placed in one of the pipe holes on the sound-board, and by the effect of the wind from the bellows upon the water in the glass tube, the pressure upon the bellows is regulated, and either more weights added to give a *stronger* wind, or the pressure is reduced by removing some of the weights.

In modern Organs different weights of wind are frequently used, for the manual stops, without increasing the number of bellows: this is done by putting two or three smaller reservoirs with expanding wind-trunks: and these reservoirs are then loaded with various amounts of weights, which thus produce the different pressures of wind.

In very large Organs several horizontal bellows are required, and they are generally of different pressures of wind.

The invention of the wind-gauge is ascribed to Christopher Förmer, of Wettin by Halle, about 1667: but many improvements have since been made in it.

*Q.* What is a *Concussion-valve*, or *Concussion-bellows?*

*A.* An apparatus consisting of a small wedge-shaped reservoir, fixed over a hole cut in one side of the wind-trunk, or at the bottom of the wind-chest. If the bellows are blown with a jerk, or if the consumption of wind be suddenly reduced, or if a large and sudden demand is made on the wind, the concussion valve assists in regulating and steadying the wind and preserving the evenness of the tone. It was the invention of Mr. J. C. Bishop.

*Q.* What is a *shifting-movement?*

*A.* An old contrivance for shutting off the loud stops by means of a pedal: it was, however, difficult to manage and fatiguing to use, and is now superseded by the *composition pedals.*

*Q.* What are the *composition-pedals?*

*A.* A system of mechanism in which the sliders are acted upon by a set of pedals, producing a series of combinations of the stops, as *pp*, *p*, *mf*, *f*, *ff*, &c. The composition pedals are usually placed immediately over the pedal clavier, in a row; sometimes they project at each side of the pedal clavier.

*The 'single-action'* composition pedal is rarely *used; it only* draws out, or pushes in, such sliders

as may be arranged, without acting upon the others: but the 'double-action' composition pedal acts both ways, drawing out and pushing in, all sliders that may be requisite to produce the desired combination.

This invention is due to the late Mr. J. C. Bishop.

Mr. Willis has invented and patented a method in which *studs* or *buttons* are used, placed immediately over each row of keys: the studs are moved by the fingers, and act upon the stops by the aid of the pneumatic action, and without any composition pedals being necessary.

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## CHAPTER IX.

### OF THE STOPS OF AN ORGAN, AND THEIR CHARACTER.

In Chapter 4 the pipes were divided, as to their structure, into two species, *Flue*, or *flute-work*; and *Reed*, or *tongue-work*: the flue-work stops are so numerous, and of such diversities of character, that they may be further subdivided.

#### FLUE-WORK STOPS.

*Q.* What stops belong to the Flue-work?

*A.* All *lip*-stops, (page 23,) of which there are *many varieties.*

### A. *Diapason-work.*

These are the most important, the chief, or *principal* * stops in an Organ, and also the most numerous. The Open Diapason is often put in front, or 'in prospect,' and is then generally made of tin, and the length of the feet of the pipes also slightly varies, in order to preserve perfect symmetry in appearance. The form of the lips is very simple, (Fig. 6, *a*,) and the pipe can either belong to the 16 or the 8 feet: the tone is bright, full, and round.

If the Organ has several Manuals the tone of the Open Diapason is of a different character in each: in the Chief Manual, or Great Organ, the pipes are of large scale, producing a clear, full, strong tone: in the second manual they are of narrow measure, with a more penetrating and somewhat cutting tone: and in the third and fourth manuals the tone is softer and more delicate.

According to the size of the Organ the Open Diapason on the Manual is of 8 feet, or 8 and 16 feet; on the Pedal it is of 16, and in very large organs of 32 feet also, the pipes of which are of wood, unless they stand in the front, when they are of tin.

To the Diapason work belong also the *Principal*, or *Octave*, 4 feet; † the *Fifteenth* or *super-octave*, 2

* In Germany the Open Diapason is called the *Principal*, as being the most important foundation stop: and thus we find *Principal 16, 8,* and 4 feet; the latter being the same as the *English Principal* 4 feet.

† *On the* Manual; and 8 feet on the Pedal.

feet,* and the *octave-fifteenth* or *twenty-second*, 1 foot.† The *fifth* or *Quint*, *Twelfth*, and *Larigot*; the *Tenth* or *Tierce*; and the *Mixture* stops, when of proportionate scale, all belong to the Diapason work.

### B. *The Flute-work proper.*

1. The *Flute*, *Flauto*, usually a soft, smooth-toned, wood stop. The flute stops have often particular names, as *Flauto traverso*, or German flute: *Flauto amabile*, *amoroso*, *dulcis*, *Dulzflöte*, *Flauto dulcio*, or *dulcet flute*, and others of which the name specifies the particular character. *Flauto major* means an 8 feet, and *Flauto minor* a 4 feet stop, which is often a stopped pipe. *Flautino* is a 2 feet, and so is *Flauto piccolo*, or simply *Piccolo*. Generally the flute-work stops are of 8 or 4 feet, and their shape is plain, Fig. 5, *a*, *b*, *c*, *d*, *e*; but there are diversities in their shape: and they occur when stopped as Fig. 7, *a*, *b*, *c*, *d*. The *Flageolet* is another small manual flute-work stop, usually of 2 feet. To this class also belong

2. *Rohrflöte*, Reed-flute, of tin, metal, or wood, half-stopped; that is, the stopper is provided with a reed or tube, by which the tone is rendered soft and clear. See Fig. 7, *b*, *d*.

* On the Manual; and 4 feet on the Pedal. The 15th sounds the octave above the Principal, and consequently a 15th or Super-Octave above the unison stops.

† On the Manual; and 2 feet on the Pedal: this rank of *pipes is seldom put* as a separate stop.

3. *Bordunflöte*, rather wide measure, like a *Bourdon*, with a full, soft tone.

4. *Harmonic Flute.* A manual open metal stop, invented by Cavaillé Col; the pipes are of double length; *i.e.*, 16 or 8 feet, and there is a hole bored in them midway between the foot and the top: they are blown by a heavy wind, and produce the 8 or 4 feet note. The tone is very full, fluty, and powerful, and gives much thickness to the general Organ tone. It is a treble stop, not extending below tenor c. Sometimes the upper pipes are *four* times their speaking length, and blow the *second* octave above.

5. *Hohlflöte*, hollow-toned flute, an open stop with rather wide measure, and a full, clear, tone. Generally of 8 and 4 feet, seldom of 16 feet.

6. *Sifflöt*, (or under various corrupted names as *Siefflöt*, *Sufflöt*, *Suifflöt*, and others), is like a *Hohlflöte*, of 2 and 1 foot, usually found in old Organs. The tone is somewhat hissing and penetrating.

7. *Spitzflöte*, Pointed-flute; open, with conical bodies, of 8, 4 and 2 feet; it has an agreeable, somewhat penetrating tone: Fig. 5, *f*.

8. *Clarabella*, an 8 feet manual stop, invented by Bishop. The pipes are of open wood, large scale, giving a thick and powerful fluty tone, somewhat resembling the *Hohlflöte*.

9. *Portunalflöte*, open pipes of wood of the Clarabella species, the bodies of them are somewhat wider at the top than the bottom; a modern stop of *8 and 4 feet;* not often met with.

*10. Dolcan* (not to be confounded with Dulciana,

which is a Reed stop:) it is an open flute-work of 8 and 4 feet, not much used at present. Of tin or wood. Fig. 7, *f*, shows the form of the pipe.

11. *Dulciana*, an open stop, of much smaller scale than the Open Diapason; of peculiarly soft and gentle tone. It is generally of metal; and of 16 and 8 feet.

12. *Dulciana Principal*, *Dulcet*, a delicate stop of 4 feet, small scale metal pipes.

13. *Doppelflöte*, thus named because it has *double-lips*, or *two mouths*, placed on opposite sides of the pipe, which make the tone very full. It is usually of 8 feet, seldom of 4 feet; of wood, and stopped: see Fig. 21.

*a*, the block bevelled off to form two under-lips.

*b*, *b*, the two caps, showing the two under-lips.

*c*, *c*, the form of the two upper-lips, within the pipe.

FIG. 21.

14. *Bifar*, *Biffara*, *Piffara*, is precisely like the *Doppelflöte* with double-lips, but one of them stands a little higher than the other, producing a pleasing sort of undulation, similar to the *Unda Maris*. Or, it has sometimes two pipes, one of them tuned a little sharper than the other; it is usually of 4 feet.

15. *Voix Célestes*, a stop of French invention, and formed of two *Dulciana* pipes: it much *resembles the Unda Maris*.

16. *Unda Maris—Meereswelle*, Waves of the sea; a stop with two pipes, one of which is tuned a little higher than the other, producing a waving kind of tone. An open stop of 8 feet.

17. *Waldflöte*, Forest-flute. In Germany this is a 2 feet stop, formerly also of 8 and 4 feet. It is open, of tin, metal, or wood; and the tone somewhat thick and hollow. The English *Waldflöte* is different to the German one, and is always of open wood 4 feet pipes of large scale, and inverted mouths (see p. 26), full toned and powerful; a species of octave *Clarabella*.

18. *Clear flute*. An open wood flute of 4 feet, invented by Kirtland and Jardine. Like the Wald-flute the pipes have the inward bevelled mouth, and the tone is exceedingly clear, firm, and full.

19. *Suabe-flute*, a tenor c Manual stop of 4 feet; the pipes are of wood, with inverted mouths. The tone is clear and liquid; not so loud as the *Wald-flute*.

20. *Celestina*, a manual 4 feet stop, open wood pipes, of small scale; producing a very delicate and subdued tone.

21. *Jubal-flute*, an open flue-work stop, of 8 and 4 feet. It sometimes occurs of 8 feet, with double-lips or two mouths.

In old German Organs other names occur, as *Blockflöte*, *Bauerflöte*, *Nachthorn*, *Scharfflöte*, *Schweizerflöte*, *Spillflöte* (*spindle-flute*) see Fig. 7, *e*; so named because its form resembles that of a spindle: it *is of 8, 4,* and 2 feet, the pipes of metal, cylindrical in *the middle* and conical at the top.

Most of these are flute-work stops, giving certain different shades of tone. Many of the stops mentioned in this class are also found in the Pedals. The following occur in the Pedals only.

22. *Violon*, or *Violone*, Double-bass. An open flue-stop; the tone is penetrating and fine, in imitation of the Double Bass. It is of narrow 16 feet scale, and the pipes are a little wider at the top than at the bottom, and furnished with ears and beard at the mouth: the speech is a little slow. Of a similar kind is the

23. *Violoncello*, an 8 feet stop, resembling in construction the *Violone*.

24. *Pyramidon*, a Pedal stop of 16 or 32 feet-tone, invented by the Rev. Sir F. G. Ouseley: its peculiarities are, the shape of the pipes, which are more than four times larger at the top than at the mouth; and also, the remarkable gravity of the tone, considering the size of the pipe: the tone resembles that of a stopped pipe.

The other Pedal stops belong to the other classes.

### C. *The stopped, or covered, pipes.*

Many of the flute-stops already named belong to the stopped-work, which has been already mentioned in Chapter 4, page 28. They are important stops in an Organ, and the tones are soft, full, and somewhat hollow; and although they appear weak toned when used singly, yet they impart much fulness to the tone when other stops are added. The *stopped pipes* seldom occur of 2 feet-tone, but very

frequently of 4, 8, and 16 feet-tone; also of 32 feet-tone in very large Organs in the Pedal, as well as, occasionally, in the Manuals.

In the Manual are found:—

| | |
|---|---|
| Grossgedackt<br>Grobgedackt | Double Stopped Diapason of 16 feet-tone. |
| Gedackt<br>Mittelgedackt | Stopped Diapason of 8 feet-tone. |
| Kleingedackt | Stopped Diapason of 4 and 2 feet-tone. |

The names *Lieblich Gedackt*, sweet-toned stopped diapason: *Stillgedackt*, quiet-toned stopped diapason; and other similar ones are often met with.

Some stops with particular names, belong especially to the *Stopped*, or *Gedackt* species, for instance the

*Bordun*, or *Bourdon*, usually of 16 feet-tone; an important stop that imparts much gravity and fulness to the united effect, and to the tones of small organs gives a certain dignity which would otherwise be wanting. In very large organs the *Bordun* of 32 feet-tone, occurs on the Manuals, but in this last case it does not always descend lower than Tenor c, the lower octave of pipes being omitted on account of the dulness of their tones, and also the great height required for them. There is no peculiarity in the shape of the pipe.

*Clarionet Flute*, very similar to the Stopped Diapason, but the holes in the stoppers are much *larger; the tone* is very agreeable, and of a reedy *quality. It is of* 8 or 4 feet-tone.

*Nason*, a wood stopped Flute of 4 feet pitch, with a very quiet and sweet tone.

To this class also belongs a very pleasing stop, the *Quintatön* (see p. 28), sometimes corrupted into *Quintadena*, *Quintgetön*, *Quinta ed una*, &c. It is of narrow measure, of slow speech, and somewhat soft, and peculiarly penetrating tone; its most characteristic feature is, however, that each pipe, in addition to the fundamental tone, sounds also, softly, but distinctly audible, the 12th or *Duodecima*; that is, the *fifth above the octave*: from this circumstance its name is derived, implying a *fifth* and a *one*, or *unison*. In the Manual it usually occurs of 8 feet-tone, rarely of 4 and 2 feet-tone; but in large Organs also of 16 feet-tone, in which case, if well made to blend with the other stops, it imparts to the tone a peculiar gravity and fulness. On the Pedal it is sometimes of 32 feet-tone. It is never used alone. Fig. 7, *a*, shows the form of the pipe in metal, with ears and a beard. It is also met with of wood.

In the Pedal belong to this class: *Sub-bass*, 16 feet-tone. This stop is always found in Organs where there is not much height allowed. It has a soft, humming, tone, and blends exquisitely in combination with an 8 feet-toned stop, as *Gedacktbass*, or *Violoncello*. Sometimes it is called *Bordunsub-bass*. As a 32 feet-toned stop it is called *Untersatz*, *Majorbass*: the form of the pipe is as Fig. 7, *c*.

D. *Flue-work stops of peculiar and distinctive character.*

1. *Viola*, an open stop of narrow measure, and

a particularly soft and agreeable, though somewhat nasal tone; the beauty of which, when well made, consists in its mournful character. The Viola is not often met with, and only upon the 3rd or 4th Manual, where it is of 16, 8, or 4 feet. More frequently is found only the

2. *Viola di Gamba*, or *Gamba*, a stop rarely wanting in an Organ, and when well made, it is one of the most beautiful and lovely character-stops. It is of tin or metal, and the tone is soft, and somewhat cutting, (imitating the bite of the bow on the string), and is often of great beauty. Usually of 8 feet, occasionally of 4 feet, and also sometimes of 16 feet as a *Gambenbass* in the Pedal. The form of the pipe is as Fig. 5, *c*. If the body is conical as Fig. 5, *f*, it is called *Spitzgambe*, pointed-gamba. In England the Gamba is often made of the conical shape, surmounted by a bell, or out-spreading top. If the *Gamba* speaks well when used alone, it is a proof of superior workmanship: but generally it is of slow intonation, and requires another soft stop, as the Stopped Diapason, to be used with it.

3. *Salicional*, *Salicet*, also sometimes *Salcional*, is often met with. It is an open pipe, of narrow measure, but not like the *Gamba;* and when well made the tone is most lovely and delicate. In the Manuals it occurs of 8 feet, rarely of 4 feet. *Salicet* in the Pedal is a soft 16 feet register, about midway between the *Sub-bass* and *Violon*, and useful for soft *playing;* where the tone of the Pedal is required to *be neither too* heavy, nor too penetrating.

4. *Fugara*, an open flute-work, generally of 8 feet,

with cutting and brighter tone than the Gamba, and it is also somewhat stronger, otherwise they much resemble each other.

5. *Keraulophon*, an 8 feet manual stop, of metal, and of a pleasant, reedy quality of tone, something like the *Gamba*. It seldom extends lower than tenor c. The pipes are cylindrical, like the *Dulciana* and the *Open Diapason*, the peculiarity in the tone being effected by a small round hole bored either in the body of the pipe, near to the top, or in a sliding cap. The Keraulophon was invented by Messrs. Gray and Davison.

6. *Geigen Principal*, Violin Diapason; an 8, and 4 feet, manual stop, with a crisp, pungent tone, very like that of the *Gamba*; but the pipes are larger, speak quicker, with a fuller tone.

7. *Gemshorn*, Goat-horn; of tin or metal, pointed at the top, of 8 feet, sometimes of 4 and 2 feet. The tone is soft, and resembling a *horn* in quality. The shape is seen in Fig 5, *g*.

8. *Violino*, open tin pipes, with clear and striking tone; it is usually of 2 feet upon the Choir, or weaker manual. This stop is not much known in England.

9. *Terpodion*, an 8 feet stop, in imitation of the tone of the *terpodion*, an instrument the sounds of which were produced from sticks of wood.

10. *Oboe-flute*, a 4 feet Manual stop, of small scale wood pipes, usually extending to tenor c. The tone is very delicate and reedy; not so strong as that *of the Viol* di Gamba.

### E. *Flue-stops, of various lengths.*

In England these are called *Mutation*, or *Filling-up* stops, and as already explained* they do *not* give a sound corresponding to the key pressed down, but some sound *g* when the CC key is pressed down, and these are called *fifth-sounding*, or *Quint* stops: others sound *e* on the CC key, and are called *third-sounding*, or *Tierce* stops. There are two kinds of these:

(*a*) Those that belong to the Diapason work, and (*b*) those that belong to the Stopped work.

Those that belong to the first series are found in almost all, even in small Organs.

1. The *Quint, Fifth, Diapente*: this is of $10\frac{2}{3}$, $5\frac{1}{3}$, $2\frac{2}{3}$, and $1\frac{1}{3}$ feet, depending always upon the size of the Open Diapason, or Foundation Stop; whether this is of 32, 16, or 8 feet. Thus the *Quint* of $10\frac{2}{3}$ belongs to a Diapason of 32 feet, and is only found where there must be at least an *Untersatz* of 32 feet-tone, to be drawn with it. The *Quint* of $5\frac{1}{3}$ feet requires an Open Diapason of 16 feet to be drawn with it; and the *Quint* or *Twelfth* of $2\frac{2}{3}$ feet, requires an 8 feet Diapason to be used with it. The relation of the *Quint*, to the Foundation Stops, is always, that it is the *fifth above the Octave*; and therefore it will be a *Twelfth* above the Foundation Stop. Thus, to the 32 feet C, the Quint will sound GG; that is, the fifth above the 16 feet C: the Quint to the 16 feet C *will be Gamut G: &c.*

* See pages 8 and 11.

The Quint $10\frac{2}{3}$ in the Pedal, is sometimes used in combination with the 16 feet Open Diapason, to produce a sort of artificial 32 feet tone.

2. *Tertia, Tierce, Terz,* Third; this is only found in large Organs, and is of $6\frac{2}{5}$, $3\frac{1}{5}$, and $1\frac{3}{5}$ feet; sounding the *Greater,* or *Major third* above the Fifteenth; or, properly, the *Seventeenth* above the Diapasons, or Foundation Tone; see page 10. The Tierce is seldom made to draw separately, it sometimes forms one of the ranks of the *Sesquialtera.*

3. *Larigot, Nineteenth, Octave Twelfth,* a small metal Mutation stop, seldom occurring separately, but generally forming a part of the *Sesquialtera.* The Larigot sounds a perfect fifth above the Fifteenth, and consequently a *Nineteenth* above the Diapasons.

The Mutation Stops, the *Quint, Tenth, Twelfth, Tierce, Larigot,* &c., can never be used alone, but only in combination with other *deeper* toned Foundation Stops, (see pages 10 & 68); and also with a more *acute* Foundation register of the next smaller size; otherwise, the effect will not be agreeable. Thus the Twelfth must have the Fifteenth also drawn; and the Tierce requires the octave Fifteenth.

To the Stopped Pipes of this species belong:

1. *Nassat,* or *Nassatquint*; (called also *Nasat, Nasal, Nazard,** &c.,) is a *Quint,* that is often found in Organs, particularly those of 2 or 3 Manuals. It is of $2\frac{2}{3}$ or $5\frac{1}{3}$ feet-tone, seldom of $1\frac{1}{3}$. In the Pedal it occurs of $5\frac{1}{3}$ and $10\frac{2}{3}$ feet-tone, and it imparts a

* *This* name is also sometimes applied to the Twelfth.

great fulness to the body of tone; the quality of which is somewhat nasal, hence its name.

A stop somewhat similar, but of different intonation, is the

2. *Rohrquinte.* In the Manual this is usually of $5\frac{1}{3}$ feet-tone, and in the Pedal of $10\frac{2}{3}$ feet-tone: it much resembles the *Nassat-quint.* The pipes are of metal, with chimneys, or reeds.

### Reed-stops.

*Q.* What are the principal *Reed-stops*, or *Tongue-work stops*?

*A.* As already explained in Chap. 4, page 33, there are two species, the *striking* reed, and the *free-reed.* The most important of these are—

1. *Posaune, Trombone,* one of the strongest and most powerful of the reed stops. It occurs in all large Organs, and in many smaller ones. In the Pedal it is of 16 and also 32 feet; on the Manual of 8 feet. The pipes are of large scale, of tin, zinc, or metal, for the Manual; and of metal, zinc, or usually wood, for the Pedal. It is a striking reed, and the pipes are pyramidal as seen in Fig. 8, *p*, *f*, page 30, and Fig. 9, C, page 31.

The 32 feet is called the *Contra-posaune.*

2. *Dulcian,* (an imitation of an obsolete wind-instrument called the *Dulzian,*) is a free-reed of 16 feet: the tone is vigorous but more mellow than the *Posaune,* and its character is mid-way between that *of the Posaune* and the *Fagotto,* or *Bassoon*; and it is *of rather wider* measure than either, and is only

met with in large Organs. The *Dulcian* must not be confounded with the *Dolcan* (page 60), a flute-work stop of rare occurrence.

3. *Bombardone, Bombardon, Bombarde*, a reed-stop of metal or wood; in the Manual of 4, 8, and 16 feet, in the Pedal 16 and 32 feet. It is more powerful than the *Bassoon*, but less so than the *Trombone*, and forms the bass of the *Shalm*, or *Schalmei*. The pipes are sometimes partially stopped, to secure a softer intonation. It is often met with in old Organs, and also in some modern ones.

4. *Fagotto, Bassoon*, a soft toned and slightly nasal striking reed, occurring in the Pedal, and also in the Manual of large Organs; of 16 and sometimes of 8 feet. It often forms the bass of the Oboe or Clarinet. The pipes are of tin, metal, or wood, small scale; and often, in German Organs, provided with a stopper or cover, in which a sound-hole is perforated. The pipes are sometimes of the inverted pyramidal shape, as shown in Fig. 8, *f*, page 30; and sometimes cylindrical as in Fig. 8, *d*.

When of 16 feet on the Manual, it is called the *Contra-Fagotto*, or *Double Bassoon*: the tone is softer than the Double Trumpet.

5. *Trumpet, Tromba*, a striking reed stop of clear, penetrating, tone, and of fine effect. It occurs on the Manual and Pedal, of 8, and sometimes of 16 feet, when it is called the *Double Trumpet*. The pipes are of tin, metal, zinc, or wood, of smaller scale than the *Posaune*.

6. *Trompette Harmonique*, a Trumpet stop the tubes

or which are of double, and sometimes of four times their usual length, and made to *overblow*, by a strong and copious wind; they sound the octave, or the super-octave above the usual note. See also *Harmonic Flute*, page 60.

7. *Clarion, Clarin, Clarino*, a Reed-stop similar to the Trumpet, but of 4 feet, both on the Manual and Pedal.

8. *Tuba, Tuba Mirabilis, Ophicleide*,—a Trumpet stop (striking reed) of large scale and on a high pressure of wind: it usually has a sound-board of its own, with a separate bellows, &c. It is the most powerful 8 feet Reed stop.

9. *Oboe, Hoboe, Hautboy*, is a striking reed, Manual stop, 8 feet, narrow measure, with slender tongues, sometimes made of Argentan. The tone is softer than that of the Trumpet, and of a thin, wailing, and penetrating character; and it often closely resembles that of the 'Orchestral Oboe.' The shape of the pipe is an inverted cone, sometimes surmounted by a bell: see Fig. 8, *a*, page 30.

When of 16 feet on the Manual it is called the *Double Hautboy*.

10. *Clarinet, Cremona, Cromorne, Cormorne*, an 8 feet Manual stop, striking reed: the pipes are cylindrical, narrow measure, and of metal: Fig 8, *c*: the tongues are slender, producing a delicate, soft tone, of great beauty and sweetness, resembling that of the Orchestral Clarionet.

11. *Corno di Bassetto, Krumm-horn*, crooked *horn: another* name for the Clarionet stop, when it *extends throughout* the compass of the Manual.

12. *Horn*, an 8 feet, striking reed, Manual stop; of tin or metal pipes, of much larger scale than the Trumpet, producing a fuller, and smoother tone, and without its peculiar clang. It was invented by Byfield.

13. *Cornopean*, an 8 feet, striking reed, on the Manual; of tin or metal pipes, nearly the same scale as the Horn, but differently voiced. The tone is more sonorous than that of the Trumpet; and smoother, but not quite so powerful, as the Horn.

14. *Schalmei*, *Chalumeau*, a reed-stop in imitation of an old wind instrument common amongst the Italian and Swiss shepherds. Similar to the Cremona, or Clarinet.

15. *Cor Anglais*, English Horn: sometimes a free-reed.

16. *Vox humana*, an 8 feet, striking reed; intended to resemble the human voice, but the imitation is very faint. It extends through the whole compass of the Swell or Choir Manual. The tubes are generally very short, like those of the Clarionet, but broader: see Fig. 8, *c*: some Organ builders, to produce a better imitation of the human voice, have given them various shapes; see Fig. 8, *b*, which consists of a funnel and a cover. When the pipes are cylindrical as in Fig. 8, *c*, the lowest notes are often half-stopped; and as the notes ascend, the stopping gradually disappears.

17. *Æoline*, a delicate, free-reed stop, of 16 or 8 feet-tone.

18. *Physharmonica*, a soft and agreeable 16 or 8

feet, free-reed stop. The pipes are either without bodies, or have tubes of only half-length. It imitates the tone of an instrument of the same name, of the Harmonium species.

In old German Organs there are a great number of reed-stops which are now obsolete; such as the *Apfel-regal*, *Bibel-regal*, and others of the same species. The *Serpent*, a reed stop in imitation of the old Orchestral instrument; *Zink*, or *Zinken*, an imitation of an obsolete Brass instrument.

## Mixture Stops.

The *Mixture*, or *Compound* stops, as already explained on page 11, have two or more pipes to each key, and these pipes sound the 3rd, 5th, and 8th above the foundation tones; and they are so placed on the sound-board, that the pipes for each separate note receive their wind from one opening in the wind-chest, thus sounding all together: (see Fig. 10, *g*, and *k*.)

*Q.* What are the names of the Mixture, or Compound Stops?

*A.* The most usual are:

1. The *Sesquialtera*, originally a stop of two ranks only, composed of a 12th and 17th, sounding a *Major Sixth*: in some Organs this stop is named the *Sexte*. In English Organs the *Sesquialtera* often *comprises 3, 4, 5,* or 6 ranks of open metal pipes, *tuned in thirds,* fifths, and octaves to the Diapasons.

In old German Organs the *Sesquialtera* is found also under the names of *Zïink, Zynk, Zink.**

2. *Mixture*; according to the size of the Organ, this is composed of 3, 4, 5, or 6 ranks of pipes, as in the *Sesquialtera*, but the Mixture is usually the more shrill and acute. In old (German) Organs the *Mixture* sometimes included 12 ranks,† and a *Mixture* is said to be 3-fold, 4-fold; or *three-voiced, four-voiced*, &c., meaning 3 or 4 *ranks*, or that number of pipes to each note.

A *Mixture* of 5 ranks would comprise a 17th, 19th, 22nd, 26th, and 29th: that is, a 3rd, 5th, 8th, 5th, and 8th, from the *ground*, or Diapason tone; and as, in the Treble, the pipes would become very small, keen, and prominent, the smaller ranks are discontinued about Middle c, and larger pipes, sounding an octave lower, are substituted. This alteration is called a 'break,' and takes place also in the *Sesquialtera*.

The *Mixture* and the *Sesquialtera* are found upon the Great Manual, and also, in large Organs, upon some of the other Manuals; and in the Pedal. Other *Mixture* Stops are constructed by different combinations of the pipes.

In England the *Sesquialtera* is the first compound stop, but in Germany the *Mixture* is usually found before the Sesquialtera.

* There is also an old Reed stop of this name.

† In the Edinburgh Music Hall Organ there is a Harmonic Mixture of 14 ranks.

3. *Cymbel*, the most acute of the Mixture stops, and formed exclusively of octaves, the largest pipe of which is only 1 foot. It is usually of 3 ranks, 1 foot, ½ foot, and ¼ foot, small scale; and the tone is very bright. As the pipes are very small, there are frequent repeats, or 'breaks,' in the upper part of the Manual. The *Cymbel* occurs on the Great Organ, after the Sesquialtera and Mixture.

4. *Fourniture*, a French name for the *Mixture*.

5. *Cornet*, a very effective stop of 3, 4, and 5 ranks, in the Manual, and sometimes in the Pedal of 6 to 8 ranks. The pipes are of large scale, and voiced loudly, producing a *horny* tone, hence its name. The *Cornet* is the only compound stop which does not repeat, or *break*. In old Organs the *Cornet* was only a Treble stop, beginning at Middle c, or Fiddle g, or, in German Organs at Tenor c. This was called the *Mounted Cornet*, the pipes being planted or *mounted* upon a small sound-board of their own, raised some 3 or 4 feet above that of the Great Organ, the wind being conducted from the Great Organ sound-board to that of the *Mounted Cornet*, through metal tubes. The *Mounted Cornet* was almost exclusively confined to old Organs, from most of which it has now been removed. It was used chiefly for playing over the melody of the Psalm tunes, and for the performance of an obsolete kind of Voluntary.

The name *Cornet* was also applied, in Germany, to an old Pedal reed-stop, of 4 or 2 feet, with a *very snarling* tone, and sometimes called Zinken.

which was the name of an obsolete Brass instrument.

6. *Echo Cornet.* This compound stop is also sometimes mounted. It is composed of the same number of ranks of pipes as the Mounted Cornet, and usually, though not always, of the same pitch, but the pipes are of very small scale, and light and delicate tone. Its usual place is in the Swell box.

Other Mixture Stops of rare occurrence:

7. *Rauschquinte, Rauschflöte, Rauschpfeif:* the 12th and 15th on one slider.

8. *Schreier, Schreipfeife,* an obsolete mixture of 1, $\frac{1}{2}$, and $\frac{1}{4}$ feet.

9. *Tertian,* a Mixture Stop of two ranks, sounding the interval of a minor third; a *Tierce* and *Larigot* on one slider.

10. *Doublette.* This is the French name for the Fifteenth; but in England it is sometimes applied to a Stop of two ranks, sounding a 15th and a 22nd above the Diapasons: the two sounds being an octave apart.

11. *Progressio harmonica,* a Mixture Stop commencing with two ranks (a third, $1\frac{3}{5}$ foot, and an octave, 1 foot), at the lowest CC of the Manual: at c a third rank (octave, 2 feet) is added. It has a very bright effect.

12. *Scharf,* sharp: a *Mixture* Stop, containing smaller pipes than the Mixture, or of a smaller scale: if there is no Tierce in the Mixture, the Scharf usually contains one.

*In the descriptions of the various Organs, those Stops which seldom occur, will be explained.*

## CHAPTER X.

### DESCRIPTIONS OF VARIOUS ENGLISH AND FOREIGN ORGANS.

*Q.* What purpose does it serve, to compare the Specifications of different Organs?

*A.* A critical examination of them teaches the fundamental principles of the distribution of the Stops. In the previous Chapters the most usual Organ Stops are enumerated and described, without regarding those which are either very seldom met with, or are obsolete. But their distribution among the various Manuals, and the proportion in which they should be, as regards the size of an Organ, has not been alluded to. This distribution, and the fundamental principles of it, are best learned by an examination of various Specifications, whereby the different sizes of Organs can be considered and compared.

The following is the description of a famous, and well-designed, small Organ, one of the finest in Germany, either of old or modern times.

I. Organ in the church of the Eleven Thousand Virgins, at Breslau: built by the elder Müller, 1826; 27 Sounding Stops, 2 Manuals, compass from CC to $f^3$ in alt; and Pedal.

HAUPTWERK (GREAT ORGAN).

1. Bordun, 16 feet-tone
2. *Principal, 8 feet*
3. *Gamba, 8 feet*
4. *Portunal, 8 feet*
5. *Doppelflöte, 8 feet*
6. Octave, 4 feet
7. Rohrflöte, 4 feet-tone
8. Quinte, $2\frac{2}{3}$ feet
9. Super-octave, 2 feet
10. Mixtur, 5 ranks
11. Clarinett, 8 feet

OBERWERK (CHOIR ORGAN).

1. Salicet, 8 feet
2. Quintatön, 8 feet-tone
3. Flauto-Major, 8 feet
4. Principal, 4 feet
5. Flauto traverso, 4 feet
6. Nassat-quinte, $2\frac{2}{3}$ feet
7. Super-octave, 2 feet
8. Mixtur, 3 ranks
9. Vox humana, Labialstimme, 8 feet

PEDAL.

1. Violon, 16 feet
2. Gamba, 16 feet
3. Sub-bass, 16 feet-tone
4. Octave, 8 feet.
5. Doppel-flöte, 8 feet-tone
6. Octave, 4 feet
7. Posaune, 16 feet

ACCESSORY STOPS, &c.

1. Choir to Great
2. Great to Pedal
3. Wind-valve to Great
4. Wind-valve to Choir
5. Wind-valve to Pedal

In this, as in many other German Organs, the Choir Organ is the Upper Manual, (the *Oberwerk*, or *Obermanual*): and is placed above the Great Organ, or *Hauptwerk*.

II. Organ in the Church of St. Sophia, at Dresden; built by Silbermann about 1750: it is a very fine instrument, and contains 33 stops,

HAUPTWERK (GREAT ORGAN).

1. Bourdon, 16 feet-tone
2. Quintatön, 16 feet-tone
3. Principal, 8 feet
4. Spitz-flöte, 8 feet
5. Rohr-flöte, 8 feet-tone
6. Octave, 4 feet
7. Gemshorn, 4 feet
8. Quint, $2\frac{2}{3}$ feet
9. Octave, 2 feet
10. Terz, $1\frac{3}{5}$ foot
11. Mixtur, 5 ranks
12. Cymbel, 3 ranks
13. Cornett, 5 ranks
14. Trompete, 8 feet
15. Clarin, 4 feet

OBERWERK (CHOIR ORGAN).

1. Quintatön, 16 feet-tone
2. Principal, 8 feet
3. Grob-gedackt, 8 feet-tone
4. Quintatön, 8 feet-tone
5. Unda Maris, 8 feet-tone
6. Octave, 4 feet
7. Rohr-flöte, 4 feet-tone
8. Nassat, $2\frac{2}{3}$ feet
9. Octave, 2 feet
10. Super-octave, 1 foot
11. Mixtur, 3 ranks
12. Vox humana, 8 feet-tone

PEDAL.

1. Principal, 16 feet
2. Bourdon, 16 feet-tone
3. Sub-bass, 16 feet
4. Cornet, 8 ranks
5. Posaune, 16 feet
6. Trompete, 8 feet

ACCESSORY STOPS, &c.

1. Coupler, Choir to Great
2. Coupler, Great to Pedal
3. Tremulant to Choir

COMPASS.

Manuals, CC to $d^3$ in alt
Pedal, CCC to tenor c.

On comparing this Organ, and others of the same Builder, with those of later times, we notice first, the small number of 8 feet *Lip-stops*, in comparison with the number of the Mixture, and Reed-stops: and especially is the small number of stops in the Pedal deserving of notice, in comparison (for instance) with the following Organ;—not a very large one. And although the excellent intonation of the single stops may be manifest in their combinations, yet it cannot be denied, that modern Organs much excel in power and fulness of tone.

III. Organ in the church of St. Bernhardin at Breslau, built by Casparini 1705, enlarged by Hartig 1831, containing 35 stops.

HAUPTWERK (GREAT ORGAN).

1. Bourdon, 16 feet-tone
2. Quintatön, 16 feet-tone
3. Principal (in front), 8 feet
4. Gamba, 8 feet
5. Flauto Major, 8 feet
6. Portunal, 8 feet
7. Octave 4 feet
8. *Doppelflöte*, 4 feet
9. *Quinte, 2⅔ feet*
10. *Super-octave, 2 feet*
11. Mixtur, 5 ranks
12. Cymbel, 2 ranks
13. Trompete, 8 feet

OBERWERK (CHOIR).

1. Prin
2. Salicet, 8 feet
3. Flauto amabile, 8 feet
4. Octave, 4 feet
5. Flauto Minor, 4 feet
6. Quinte, 2⅔ feet

7. Super-octave, 2 feet
8. Mixture, 4 ranks
9. Cymbel, 2 ranks
10. Oboe, 8 feet

PEDAL.

1. Major-bass, 32 feet
2. Principal (in front), 16 feet
3. Violon, 16 feet
4. Sub-bass, 16 feet-tone
5. Major Quint, $10\frac{2}{3}$ feet
6. Violon, 8 feet
7. Doppelflöte, 8 feet
8. Quintatön, 8 feet-tone
9. Super-octave, 4 feet
10. Posaune, 32 feet
11. Posaune, 16 feet
12. Trompete, 8 feet

ACCESSORY STOPS, &c.

1. Choir to Great
2. Great to Pedal
3. Wind-valve to Great
4. Wind-valve to Choir
5. Wind-valve to Pedal Flue Stops
6. Wind-valve to Pedal Reed Stops

There are 4 large Bellows

In this Organ the deficiency of cornets is remarkable, and also the large number of Pedal stops; particularly in comparison with the following Organs, many of which are larger.

IV. Organ in St. Mary's Church at Dresden, built in 1736 by G. Silbermann, and containing 43 Stops, 3 Manuals and Pedal, including a stopped Register of 32 feet-tone.

HAUPTWERK (GREAT ORGAN).

1. Principal, 16 feet
2. Octave, 8 feet
3. Viola di Gamba, 8 feet
4. Rohrflöte, 8 feet-tone
5. Octave, 4 feet
6. Spitzflöte, 4 feet
7. Quinte, $2\frac{2}{3}$ feet
8. Octave, 2 feet
9. Tertia, $1\frac{3}{5}$ foot
10. Mixture, 4 ranks
11. *Cornett, 5 ranks*
12. *Cymbel, 3 ranks*
13. Fagott, 16 feet
14. Trompete, 8 feet

OBERWERK (UPPER MANUAL).

1. Quintadena, 16 feet-tone
2. Principal, 8 feet
3. Gedackt, 8 feet-tone
4. Quintatön, 8 feet-tone
5. Octave, 4 feet
6. Rohrflöte, 4 feet-tone
7. Nassat, $2\frac{2}{3}$ feet
8. Octave, 2 feet
9. Tertia, $1\frac{3}{5}$ feet

10. Mixture, 4 ranks
11. Vox humana, 8 feet-tone

BRUSTWERK (LOWER MANUAL).

1. Gedackt, 8 feet-tone
2. Principal, 4 feet
3. Rohrflöte, 4 feet-tone
4. Nassat, 2⅔ feet
5. Octave, 2 feet
6. Gemshorn, 2 feet
7. Quinte, 1⅓ foot
8. Sifflöte, 1 foot
9. Mixture, 3 ranks
10. Chalumeau, 8 feet-tone

PEDAL.

1. Untersatz, 32 ft.-tone
2. Principal-bass, 16 feet
3. Octave-bass, 8 feet
4. Octave, 4 feet
5. Mixture, 6 ranks
6. Posaune, 16 feet
7. Trompete, 8 feet
8. Clarin, 4 feet

NEBEN REGISTER.

1. Tremulant
2. Schwebung
3. Bass Ventil
4. Coppel
5. Klingel*

## V. Organ in St. Mary Magdalen, at Breslau, built in 1725 by J. Röder, repaired and enlarged by Engler 1821. It possesses 55 Stops, 3 Manuals and Pedal, 3415 Pipes, and 10 pairs of Bellows.

HAUPTWERK (GREAT ORGAN).

1. Contra-principal, of tin, in front, 16 feet
2. Quintatön, metal, 16 feet-tone
3. Principal, metal, 8 feet
4. Salicet, tin, 8 feet
5. Flauto allemande, major, wood, 8 feet-tone
6. Qnintatön, metal, 8 ft.-tone
7. Octave, metal, 4 feet
8. Rohrflöte, metal, 4 feet-tone
9. Quinte, metal, 2⅔ feet
10. Super-octave, metal, 2 feet
11. Mixture, 8 ranks, 1⅓ foot
12. Scharf, 4 ranks, 1 foot
13. Rauschquinte, 2 ranks, 2⅔ feet
14. Trompete, metal, 8 feet

OBERWERK (UPPER MANUAL).

1. Principal, tin, in front, 8 ft.
2. Gemshorn, metal, 8 feet
3. Salicet to tenor f, tin, 8 feet
4. Flauto major, wood, 8 feet-tone
5. Octave, metal, 4 feet
6. Doppel Spitzflöte, wood, 4 feet
7. Fugara, metal, 4 feet
8. Quinte, metal, 2⅔ feet
9. Super-octave, metal, 2 feet

* A Bell, see page 51.

10. Waldflöte, metal, 2 feet
11. Mixture, 6 ranks, metal. 1½ foot
12. Cymbel, 3 ranks, metal, 1⅓ foot
13. Vox humana, wood, 8 feet-tone

UNTERWERK (LOWER MANUAL).

1. Principal, of tin, in front, 8 feet
2. Salicet, to fiddle g, wood, 8 feet
3. Flauto allemande, metal, 8 feet
4. Flauto amabile, wood, 8 feet
5. Octave, metal, 4 feet
6. Spitzflöte, metal, 4 feet
7. Doppelflaut, wood, 4 ft.-tone
8. Quint, metal, 2⅔ feet
9. Super-octave, metal, 2 feet
10. Mixture, 4 ranks, 1⅓ foot
11. Cymbel, 2 ranks, 1 foot
12. Oboe, metal, 8 feet

PEDAL.

1. Principal, 32 feet
2. Octave, metal, 16 feet
3. Violon, wood, 16 feet
4. Salicet, wood, 16 feet
5. Sub-bass, wood, 16 feet-tone
6. Octavbass, wood, 8 feet
7. Violoncello, wood, 8 feet
8. Doppelflötenbass, wood, 8 feet-tone
9. Flötenbass, open, wood, 8 feet
10. Quinte, metal, 5⅓ feet
11. Super-octave, metal, 4 feet
12. Mixture, 5 ranks, metal, 4 feet
13. Posaune, wood, 32 feet
14. Posaune, wood, 16 feet
15. Fagott, metal, 16 feet
16. Trompete, tin, 8 feet

ACCESSORY STOPS, &c.

1. Lower Manual to Great
2. Upper Manual to Great
3. Wind-valve to Great
4. Wind-valve to Lower Manual
5. Wind-valve to Upper Manual
6. Wind-valve to Pedal Flue-work
7. Wind-valve to Pedal Reed-work
8. Glockenspiel to Great
9. Glockenspiel to Pedal

COMPASS.

Manuals, CC (without CC sharp) to $c^3$ in alt.

Pedal, CCC (without CCC sharp) to tenor d.

These Organs are peculiar for the many stops of the same name upon the different Manuals, the similarity of the Mixtures, and the number of the Pedal stops.

The following very large Organ is one of the finest and most modern in Germany.

## VI. *The Organ* in St. Paul's Church, Frankfort.

on the Maine, was built in 1833 by Walker, of Ludwigsburg, and contains 74 Stops, 3 Manuals, and double Pedal. The Stops are placed over as well as at the sides of the Manuals.

1 MANUAL.

1. Untersatz, 32 feet-tone
2. Principal, in front, 16 feet
3. Viola di Gamba, 16 feet
4. Tibia* major, 16 feet
5. Octave, 8 feet
6. Viola di Gamba, 8 feet
7. Gemshorn, 8 feet
8. Jubalflöte, 2 mouths, 8 feet
9. Quint, $5\frac{1}{3}$ feet
10. Octave, 4 feet
11. Hohlflöte, 4 feet
12. Fugara, 4 feet
13. Gemshornterz, $3\frac{1}{5}$ feet
14. Quint, $2\frac{2}{3}$ feet
15. Super-octave, 2 ranks, 2 feet
16. Waldflöte, 2 feet
17. Terzdiscant, $1\frac{3}{5}$ foot
18. Kleinoctave, 1 foot
19. Mixture, 5 ranks, 2 feet
20. Scharf, 4 ranks, 1 foot
21. Cornett, 5 ranks, $10\frac{2}{3}$ feet
22. Tuba, striking-reed, 16 feet
23. Trompete, 8 feet

2 MANUAL.

1. Bordun, 16 feet-tone
2. Principal, in front, 8 feet
3. Salicional, 8 feet
4. Dolce,† 8 feet
5. Gedackt, 8 feet-tone
6. Quintatön, 8 feet-tone
7. Quintflöte, $5\frac{1}{3}$ feet-tone
8. Octave, 4 feet
9. Flauto traverso, 4 feet
10. Rohrflöte, 4 feet-tone
11. Gemshornquint, $2\frac{2}{3}$ feet
12. Octave, 2 feet
13. Mixture, 5 ranks, 2 feet
14. Posaune, 8 feet
15. Vox humana, 8 feet

3 MANUAL.

1. Quintatön, 16 feet-tone
2. Principal, 8 feet
3. Harmonica,‡ 8 feet
4. Bifara, 8 feet
5. Hohlflöte, 8 feet
6. Gedackt, two mouths, 8 feet-tone
7. Spitzflöte, 4 feet
8. Dolcissimo, 4 feet
9. Flute d'amour, 4 feet
10. Gedackt, 4 feet-tone
11. Nazard, $2\frac{2}{3}$ feet
12. Flautino, 2 feet
13. Hautbois, 8 feet
14. Physharmonica, 8 feet

* Tibia or Flute: Double Stopped Diapason.

† A delicate flute-work stop, similar to *Dolcissimo* in the third manual.

‡ *One of Walker's* useful open wood stops of a soft striking *tone.*

1 PEDAL.

1. Contrabass, open, 32 feet
2. Sub-bass, open, 32 feet
3. Principal-bass, in front, 16 ft.
4. Octave-bass, 16 feet
5. Violon, 16 feet
6. Quint, 10⅔ feet
7. Octave, 8 feet
8. Violoncello, 8 feet
9. Terz, 6⅖ feet
10. Quint, 5⅓ feet
11. Octave, 4 feet
12. Posaune, 16 feet
13. Trompete, 8 feet
14. Clarino, 4 feet
15. Cornettino, 2 feet

2 PEDAL.

1. Sub-bass, 16 feet-tone
2. Violon d'amour, 16 feet

3. Principal, 8 feet
4. Flöte, 8 feet
5. Flöte, 4 feet
6. Waldflöte, 2 feet
7. Fagott, 16 feet

ACCESSORY STOPS, &c.

1. Coupler, Manual 2 to Man. 1
2. Coupler, Manual 3 to Man. 2
3. Coupler, Manual 1 to Pedal 1
4. Coupler, Manual 2 to Pedal 2
5. Coupler, Pedal 2 to Pedal 1
6, 7, 8, 9, 10,—Five wind-trunk valves

COMPASS.

Manuals, CC to $f^3$ in alt, 54 keys.
Pedal CC to d, 27 keys.

The 3rd Manual is enclosed in a lattice-box.* There are 12 Bellows. The quality and variety of tone of the numerous 16, 8, and 4 feet Manual Flue-stops, are very fine.

VII. The Organ of the Cathedral in Merseberg, built by Fr. Ladegast of Weissenfels, 1855, contains 4 Manuals, and Pedal, and 79 Stops.

1. HAUPTWERK (GREAT ORGAN).

1st Division.

1. Principal, 16 feet
2. Principal, 8 feet
3. Octave, 4 feet
4. Spitzflöte, 4 feet
5. Gedackt, 4 feet-tone
6. Quinte, 2⅔ feet
7. Octave, 2 feet
8. Doublette, 4 and 2 feet

* Probably a Swell-box.

9 Mixture, 4 ranks
10. Scharf, 4 ranks
11. Cornett, 4 ranks
12. Trompete, 8 feet

2nd Division.

13. Bordun from c, 32 feet
14. Bordun, 16 feet
15. Hohlflöte, 8 feet
16. Gemshorn, 8 feet
17. Gamba, 8 feet
18. Doppelflöte, 8 feet
19. Quinte, $5\frac{1}{3}$ feet
20. Fagott, 16 feet

2. Oberwerk (Upper Manual).

1. Principal, 8 feet
2. Quintatön, 16 feet
3. Rohrflöte, 8 feet
4. Viola di Gamba, 8 feet
5. Flauto amabile, 8 feet
6. Gedackt, 8 feet-tone
7. Octave, 4 feet
8. Gemshorn, 4 feet
9. Rohrflöte, 4 feet
10. Quinte, $2\frac{2}{3}$ feet
11. Waldflöte, 2 feet
12. Terz, $1\frac{3}{5}$ foot
13. Sifflöte, 1 foot
14. Mixture. 4 ranks
15. Schalmei, 8 feet
16. Stahlspiel,* 8 feet

3. Rückpositiv (Back-choir).

1. Bordun, 16 feet-tone
2. Flauto traverso, 8 feet
3. Gambe, 8 feet
4. Quintatön, 8 feet
5. Principal, 4 feet
6. Gedackt, 4 feet
7. Octave, 2 feet
8. Mixture, 4 ranks
9. Cornett, 4 ranks
10. Oboe, 8 feet

4. Clavier (Echowerk).

1. Fugara, 8 feet
2. Lieblich Gedackt, 16 feet-tone
3. Flauto dolce, 8 feet
4. Salicional, 8 feet
5. Unda Maris, 8 feet
6. Lieblich Gedackt, 8 feet-tone
7. Octave, 4 feet
8. Salicional, 4 feet
9. Zartflöte, 4 feet
10. Nassat, $2\frac{2}{3}$ feet
11. Progressio harmonica, 2—4 ranks
12. Cymbel, 3 ranks
13. Æoline, 16 feet

5. Pedal.

1st Division.

1. Principalbass, 16 feet
2. Salicet, 16 feet
3. Sub-bass, 16 feet
4. Bassflöte, 8 feet
5. Octavbass, 8 feet
6. Octavbass, 4 feet
7. Dulcian, 16 feet

2nd Division.

8. Violoncello, 8 feet
9. Nassat, $10\frac{2}{3}$ feet
10. Terz, $6\frac{4}{5}$ feet
11. Nassat, $5\frac{1}{3}$ feet

* *Stahlspiel, as Glockenspiel*; the tone is produced by a *hammer striking bars of steel*: see the Bolton Organ, page 98.

12. Octave, 4 feet
13. Flöte, 4 feet
14. Cornett, 4 ranks
15. Trompete, 8 feet
16. Clarino, 4 feet

3rd Division.

17. Untersatz, 32 feet
18. Posaune, 32 feet
19. Violon, 16 feet
20. Posaune, 16 feet

With the accessory Stops, the Ventils, Couplers, Tremulants, &c., the Registers amount to 100. There are 8 large Bellows, some of which were used in the previous Organ; and the whole of the *front-work*, and also many of the single Stops are remaining from the old instrument.

VIII. The Organ in the Marien-Kirche in Lubeck, erected originally 1518, by Barthold Hering, and rebuilt in 1851—1854, by Schulze and Son, of Paulinzelle. It now contains 81 Stops upon 4 Manuals and double Pedal.

1 Clavier.

1. Bordun from c, 32 feet-tone
2. Principal, 16 feet
3. Viola major, 16 feet
4. Bordun, 16 feet-tone
5. Principal, 8 feet
6. Gemshorn, 8 feet
7. Hohlflöte, 8 feet
8. Viola di Gamba, 8 feet
9. Gedackt, 8 feet-tone
10. Quint, $5\frac{1}{3}$ feet
11. Octave, 4 feet
12. Violino, 4 feet
13. Spitzflöte, 4 feet
14. Nassat, $2\frac{2}{3}$ feet
15. Cornett, 4 ranks
16. Mixture, 5 ranks
17. *Cymbel*, 3 ranks
18. Rauschquinte, 2 ranks
19. Tuba, 16 feet
20. Trompete, 8 feet
21. Clarino, 4 feet

2 Clavier.

1. Principal, 16 feet
2. Bordun, 16 feet-tone
3. Principal, 8 feet
4. Salicional, 8 feet
5. Spitzflöte, 8 feet
6. Portunalflöte, 8 feet
7. Gedackt, 8 feet-tone
8. Octave, 4 feet
9. Gemshorn, 4 feet
10. Rohrflöte, 4 feet-tone
11. Quinte, $2\frac{2}{3}$ feet
12. Octave, 2 feet

13. Mixture, 5 ranks
14. Scharf, 3 ranks
15. Physharmonica, 16 feet
16. Trompete, 8 feet

3 CLAVIER.

1. Lieblich Gedackt, 16 feet-tone
2. Geigenprincipal, 8 feet
3. Terpodion, 8 feet
4. Lieblich Gedackt, 8 feet-tone
5. Flauto traverso, 8 feet
6. Jubalflöte, 8 feet
7. Geigenprincipal, 4 feet
8. Zartflöte, 4 feet
9. Flauto traverso, 4 feet
10. Spitzquinte, $2\frac{2}{3}$ feet
11. Waldflöte, 2 feet
12. Flageolet, 1 foot
13. Æoline, 8 feet
14. Oboe, 8 feet
15. Progressio harmonica, 3 and 6 ranks

4 CLAVIER.

1. Tibia major, 16 feet
2. Principal, 8 feet
3. Fugara, 8 feet
4. Flauto dolce, 8 feet
5. Flauto amabile, 8 feet
6. Octave, 4 feet
7. Viole d'amour, 4 feet
8. Clarinetto, 8 fee
9. Progressio harmonica, 3 and 6 ranks

1 PEDAL.

1. Grossprincipal, 32 feet
2. Principal, 16 feet
3. Basso major, 16 feet
4. Violon, 16 feet
5. Majorquint, $10\frac{2}{3}$ feet
6. Basso minor 8 feet
7. Violoncello, 8 feet
8. Terz, $6\frac{2}{5}$ feet
9. Quinte, $5\frac{1}{3}$ feet
10. Octave, 4 feet
11. Contra posaune, 32 feet
12. Posaune, 16 feet
13. Trompete, 8 feet
14. Schalmei, 4 feet
15. Cornett, 5 ranks

2 PEDAL.

1. Sub-bass, 16 feet
2. Doppelflötenbass, 16 feet
3. Violoncello, 8 feet
4. Gedacktbass, 8 feet
5. Fagotto, 16 feet

This Organ has 12 bellows, 8 to the Manuals; 2 to the 2nd Pedal; and 4 to the 1st Pedal. The stops amount to 95 including the Secondary-stops, Ventils, &c.

IX. Organ in the Church of St. Nicolai, Leipzig, *built in the years* 1859—1862 by Fr. Ladegast, of

Weissenfels; it contains 4 Manuals and Pedal, and 85 Stops.

1 Manual.

1st Division.

1. Principal, 16 feet
2. Principal, 8 feet
3. Octave, 4 feet
4. Octave, 2 feet
5. Quinte, $2\frac{2}{3}$ feet
6. Terzflöte, $3\frac{1}{5}$ feet
7. Terz, $1\frac{3}{5}$ foot
8. Septime, $2\frac{1}{7}$ feet
9 and 10. Cornett, 5 ranks
11. Mixture, 4 ranks
12. Cymbel, 3 ranks
13. Trompete, 8 feet

2nd Division.

14. Bordun from c, 32 feet-tone
15. Bordun, 16 feet-tone
16. Doppelgedackt, 8 feet
17. Gambe, 8 feet
18. Gemshorn, 8 feet
19. Rohrflöte, 4 feet
20. Spitzflöte, 4 feet
21. Rohrquinte, $5\frac{1}{3}$ feet
22. Fagott, 16 feet

2 Manual.

1st Division.

1. Principal, 8 feet
2. Octave, 4 feet
3. Gedackt, 4 feet
4. Spitzquinte, $2\frac{2}{3}$ feet
5. Octave, 2 feet
6. Waldflöte, 2 feet
7. Quinte, $1\frac{1}{3}$ foot
8. Terz, $1\frac{3}{5}$ foot
9. Flageolet, 1 foot
10. Oboe, 8 feet
11. Cornett, 3 ranks
12. *Cymbel*, 4 ranks

2nd Division.

13. Principal, 16 feet
14. Quintatön, 16 feet
15. Fugara, 8 feet
16. Quintatön, 8 feet
17. Rohrflöte, 8 feet
18. Bordunflöte, 8 feet
19. Hohlflöte, 4 feet
20. Vox humana, 8 feet

3 Manual.

1st Division.

1. Geigenprincipal, 8 feet
2. Lieblich Gedackt, 16 feet
3. Flauto traverso, 8 feet
4. Doppelflöte, 8 feet
5. Harmonica, 8 feet
6. Piffero, 4 feet

2nd Division.

7. Octavflöte, 4 feet
8. Octave, 4 feet
9. Rohrquinte, $2\frac{2}{3}$ feet
10. Piccolo, 2 feet
11. Clarinetto, 4 feet
12. Scharf, 3 ranks

4 Manual. (Echowerk.)

1. Viola, 16 feet
2. Sanftflöte, 8 feet
3. Salicional, 8 feet
4. Viole d'amour, 8 feet
5. Lieblich Gedackt, 8 feet
6. Unda Maris, 8 feet
7. Zartflöte, 4 feet
8. Viola, 4 feet
9. Violino, 2 feet
10. Nassat, $2\frac{2}{3}$ feet
11. Harm. ætheric, 3 ranks
12. Æoline, 16 feet.

PEDAL.

1st Division.

1. Principalbass, 32 feet
2. Untersatz, 32 feet
3. Posaune, 32 feet
4. Posaune, 16 feet
5. Octavbass, 8 feet
6. Nassat, $10\frac{2}{3}$ feet
7. Nassat, $5\frac{1}{3}$ feet
8. Octavbass, 4 feet
9. Trompete, 8 feet
10. Trompete, 4 feet
11. Cornett, 5 ranks
12. Terz, $12\frac{4}{5}$ feet

2nd Division.

13. Violon, 16 feet
14. Principalbass, 16 feet
15. Sub-bass, 16 feet
16. Salicet, 16 feet
17. Violoncello, 8 feet
18. Gedacktbass, 8 feet
19. Dulcian, 16 feet

With the secondary Stops this Organ contains 97 Registers, besides the Ventils to each division of the Manuals and the Pedal, and which are controlled by means of treadles for the feet, placed over the Pedal clavier. The Organ contains also the Pneumatic Action. There are 9 large cylinder-bellows, worked by handles, besides 3 smaller bellows that belong to the pneumatic work.

The following is one of the largest Organs in Germany.

X. Organ in the Cathedral at Ulm, built by Eberhard Fr. Walker, of Ludwigsburg. It contains upon 4 Manuals, and double Pedal, 95 Stops.

1 WERK.

1. Principal, 16 feet
2. Fagotto, 16 feet
3. Tibia major, 16 feet
4. Viola di Gamba, 16 feet
5. Untersatz from c, 32 feet
6. Octave, 8 feet
7. *Flauto*, 8 feet
8. *Gedackt*, 8 feet
9. *Viola* di Gamba, 8 feet
10. Trompete, 8 feet
11. Gemshorn, 8 feet
12. Salicional, 8 feet
13. Quinte, $5\frac{1}{3}$ feet
14. Octave, 4 feet
15. Fugara, 4 feet
16. Rohrflöte, 4 feet
17. Flöte, 4 feet
18. Clarino, 4 feet
19. Terz, $3\frac{1}{5}$ feet

20. Octave, 2 feet
21. Octave, 1 foot
22. Clarinetto, 2 feet
23. Waldflöte, 2 feet
24. Cornett, 10⅔ feet
25. Mixture, 4—10 ranks
26. Scharf, 2—5 ranks
27. Sesquialtera, 2 ranks

### 2 Werk.

1. Principal, 8 feet
2. Salicional, 16 feet
3. Gedackt, 16 feet
4. Dolce, 8 feet
5. Gedackt, 8 feet
6. Flauto, 8 feet
7. Trompete, 8 feet
8. Fagott and Clarinette, 8 feet
9. Quintatön, 8 feet
10. Quintflöte, 5⅓ feet
11. Octave, 4 feet
12. Piffero, 4 feet
13. Flauto traverso, 4 feet
14. Kleingedackt, 4 feet
15. Spitzflöte, 4 feet
16. Viola, 4 feet
17. Nachthorn, 4 feet
18. Octave, 2 feet
19. Piccolo, 2 feet
20. Mixture, 8 ranks
21. Cymbel, 3 ranks

### 3 Werk.

1. Bordun, 16 feet
2. Bordun, 8 feet
3. Spitzflöte, 8 feet
4. Harmonica, 8 feet
5. Gedackt, 8 feet
6. Bifara, 8 feet
7. Physharmonica, 8 feet
8. *Vox humana*, 8 feet
9. Dolce, 4 feet
10. Octave, 4 feet
11. Gemshorn, 4 feet
12. Hautbois, 4 feet
13. Nassat, 2⅔ feet
14. Flautino, 2 feet
15. Octave, 2 feet
16. Mixture, 5 ranks

### 4 Werk

Comprehends all the Reed-stops of the above Manuals.

1. Fagotto, 16 feet
2. Trompete, 8 feet
3. Clarino, 4 feet
4. Clarinetto, 2 feet

} belonging to the 1st Manual

5. Trompete, 8 feet
6. Fag. and Clar., 8 feet

} belonging to the 2nd Manual

7. Physharm, 8 feet
8. Vox humana, 8 feet
9. Hautbois, 8 feet

} belonging to the 3rd Manual

### 1 Pedal.

1. Principalbass, 32 feet
2. Principalbass, 16 feet
3. Bombarde, 32 feet
4. Untersatz, 32 feet
5. Sub-bass, 16 feet
6. Posaune, 16 feet
7. Fagotto, 16 feet
8. Violonbass, 16 feet
9. Octavbass, 16 feet
10. Trompete, 8 feet
11. Posaune, 8 feet
12. Octavbass, 8 feet
13. Violoncello, 8 feet
14. Viola di Gamba, 8 feet
15. Flötenbass, 8 feet
16. Octave, 4 feet
17. Clarino, 4 feet

18. Nachthorn, 4 feet
19. Cornettino, 2 feet
20. Grossnassat, $10\frac{2}{3}$ feet
21. Terz, $6\frac{2}{5}$ feet
22. Quinte, $5\frac{1}{3}$ feet
23. Cornett, 5 ranks, 4 feet
24. Pauke,* 1 foot

2 Pedal.

1. Violonbass, 16 feet
2. Gedacktbass, 16 feet
3. Serpent, 16 feet
4. Flauto, 8 feet
5. Bassethorn, 8 feet
6. Flauto, 4 feet
7. Hohlflöte, 2 feet

In this Organ the 4th Manual has no separate stops of its own, but it acts upon all the Reed-stops of the other Manuals, and they can be either used singly or in combination. The great number of the 4 feet stops, particularly upon the 2nd Manual, must also be noticed; they give much distinctness and clearness to the tone, as required in so large a building. In addition to the number of the Registers in the 1st Pedal, is a Kettle-drum stop.

In contrast to these specifications of German Organs, it will be interesting to compare some of the largest and finest of the English and French Organs.

XI. The Organ in St. Sulpice, in Paris, contains 66 stops upon 4 Manuals and Pedal. The compass of each Manual is from AA to $f^3$ in alt, 57 keys: compass of the Pedal CCC to tenor d, 27 keys.

1. Clavier (Great Organ).
1. Montre,† 32 feet
2. Montre, 16 feet
3. Bourdon, 16 feet-tone
4. Montre, 8 feet
5. Bourdon, 8 feet-tone
6. Flûte, 8 feet
7. Gambe, 8 feet

* A Drum.

† Montre, *mounted*, in *front*. A stop is thus named when some of the pipes are placed in the front of the case. The stop is of the Diapason species.

8. Salicional, 8 feet
9. Prestant,* 4 feet
10. Flûte à Pavillon, 8 feet
11. Doublette,† 2 feet
12. Keraulophon, 8 feet
13. Fourniture, } 9 ranks
14. Fourniture, }
15. Cymbale, 4 ranks
16. Cornet, 5 ranks
17. Euphone, 16 feet
18. Trompette, 8 feet
19. Trompette, 8 feet
20. Clarion, 4 feet
21. Clarion, 4 feet
22. Clarinette, 8 feet

2. Positif (Choir).

1. Bourdon, 16 feet-tone
2. Montre, 8 feet
3. Bourdon, 8 feet-tone
4. Flûte, 8 feet
5. Gambe, 8 feet
6. Prestant, 4 feet
7. Dulciana, 4 feet
8. Nazard, $2\frac{2}{3}$ feet
9. Doublette, 2 feet
10. Fourniture, 5 ranks
11. Cymbale, 4 ranks
12. Cornet, 5 ranks
13. Trompette, 8 feet
14. Clarion, 4 feet
15. Basson, 8 feet
16. Hautbois, 8 feet
17. Clarinette, 8 feet
18. Cromorne, 8 feet

3. Recit. expressif (Swell).

1. Bourdon, 16 feet-tone
2. Flûte, 8 feet
3. Flûte harmonique, 8 feet
4. Bourdon, 8 feet-tone
5. Prestant, 4 feet
6. Cornet, 5 ranks
7. Trompette,‡ 8 feet
8. Hautbois, 8 feet
9. Cor Anglais, 8 feet
10. Voix humaine, 8 feet

4. Clavier des Bombardes.

1. Bombarde, 16 feet
2. Trompette, 8 feet
3. Clarion, 4 feet
4. Cornet, 5 ranks

Pedale.

1. Flûte, 32 feet
2. Flûte, 16 feet
3. Bourdon, 16 feet-tone
4. Flûte, 8 feet
5. Flûte, 8 feet
6. Flûte, 4 feet
7. Bombarde, 32 feet
8. Bombarde, 16 feet
9. Trompette, 8 feet
10. Trompette, 8 feet
11. Basson, 8 feet
12. Clarion, 4 feet

Although this somewhat resembles the German Organs in its plan, yet the Stops do not indicate so

* *Prestant*, of the Diapason or Principal species, but not *mounted*.

† *Doublette*, Octave; the Fifteenth.

‡ This *Trompette* is on a strong wind, and placed in a *separate* box in front, just above the organist.

much variety, at least in name; and the predominance of Reed-stops imparts to it more the character of a great Harmonium. The mechanical arrangements of this Organ are exceedingly ingenious. It was originally built in 1781 by Clicquot, and remodelled by Cavaillé in 1845, at which time Barker's Pneumatic Lever was introduced.

Pedales de Combinaison.

1. Great to Pedal
2. Positif to Great
3. Bombarde to Great
4. Recit. to Great
5. Tremulant Pedal
6. Swell Pedal
7. Swell Pedal to Trompette on a strong wind

XII. The Organ in St. George's Hall, Liverpool, is one of the largest in England. It was built by Mr. Willis, and contains 4 Manuals and Pedal, with 100 Stops. The compass of the Manuals is from GG to $a^3$ in altissimo, 63 notes; the compass of the Pedals from CCC to f, 30 notes.

Great Organ.

1. Double Diapason, 16 feet
2. Open Diapason, 8 feet
3. Open Diapason, 8 feet
4. Open Diapason, 8 feet
5. Open Diapason (wood), 8 feet
6. Stopped Diapason, 8 feet
7. Principal, 4 feet
8. Principal, 4 feet
9. Quint, 6 feet
10. Flute, 4 feet
11. Tenth, $3\frac{1}{5}$ feet
12. Twelfth, 3 feet
13. Fifteenth, 2 feet
14. Fifteenth, 2 feet
15. Doublette, 2 ranks
16. Sesquialtera, 6 ranks
17. Mixture, 4 ranks
18. Fourniture, 4 ranks
19. Cymbale, 5 ranks
20. Posaune, 16 feet
21. Ophicleide, 8 feet
22. Trombone, 8 feet
23. Trumpet, 8 feet
24. Clarion, 4 feet
25. Clarion, 4 feet

Choir.

1. Double Diapason (closed wood), 16 feet
2. Open Diapason, 8 feet
3. Dulciana, 8 feet

4. Viol di Gamba, 8 feet
5. Stopped Diapason, 8 feet
6. Clarabella, 8 feet
7. Octave Gamba, 4 feet
8. Principal, 4 feet
9. Celestina
10. Flute harmonic, 4 feet
11. Flageolet, 2 feet
12. Twelfth, 3 feet
13. Fifteenth, 2 feet
14. Mixture, 3 ranks
15. Cremona, 8 feet
16. Trumpet, 8 feet
17. Orchestral Oboe (tenor c), 8 feet
18. Clarion, 4 feet

SWELL.

1. Double Diapason, 16 feet
2. Open Diapason, 8 feet
3. Open Diapason, 8 feet
4. Stopped Diapason, 8 feet
5. Dulciana, 8 feet
6. Principal, 4 feet
7. Principal, 4 feet
8. Flute (open, wood)
9. Flute (closed, wood), 4 feet
10. Twelfth, 3 feet
11. Fifteenth, 2 feet
12. Fifteenth, 2 feet
13. Doublette, 2 ranks
14. Piccolo (open, wood), 2 feet
15. Sesquialtera, 3 ranks
16. Mixture, 3 ranks
17. Furniture, 4 ranks
18. Trombone, 16 feet
19. Contra Hautboy, 16 feet
20. Horn, 8 feet
21. Trumpet, 8 feet
22. Oboe, 8 feet
23. Ophicleide, 8 feet
24. Clarion, 4 feet
25. Clarion, 4 feet

SOLO.

1. Double Diapason (closed, wood), 16 feet
2. Open Diapason (wood), 8 feet
3. Stopped Diapason, 8 feet
4. Flute (orchestral), 4 feet
5. Flageolet, 2 feet
6. Oboe (orchestral), tenor c, 8 feet
7. Clarionet, tenor c, 8 feet
8. Corno di Bassetto, 8 feet
9. Horn, 8 feet
10. Ophicleide, 8 feet
11. Trombone, 8 feet
12. Trumpet, 8 feet
13. Trumpet harmonic, 8 feet
14. Bassoon, 8 feet
15. Contra Fagotto, 16 feet

PEDAL.

1. Double Diapason (open, wood), 32 feet
2. Double Diapason (open, metal), 32 feet
3. Open Diapason (wood), 16 feet
4. Open Diapason (metal), 16 feet
5. Salcional (open, metal), 16 feet
6. Bourdon (closed, wood), 16 feet
7. Principal (wood), 8 feet
8. Principal (metal), 8 feet
9. Quint, 6 feet
10. Fifteenth, 4 feet
11. Mixture, 3 ranks
12. Fourniture, 5 ranks
13. Posaune, 32 feet
14. Trombone, 16 feet
15. Ophicleide, 16 feet
16. Trumpet, 8 feet
17. Clarion, 4 feet

| Accessory Stops, &c. | |
|---|---|
| Swell to Great | Great to Swell |
| Choir to Great | Choir to Pedal |
| Solo to Great | Great to Pedal |
| Solo to Choir | Swell to Pedal |
| | Solo to Pedal |

The wind is supplied by two immense Bellows, blown by a steam engine, placed in the vaults under the Hall. There are besides, 12 other bellows, or reservoirs, each supplying air, at an appropriate pressure, to certain pipes. The Pneumatic Lever is applied to each Manual, and also to the Couplers. There is a double set of Pneumatic Levers to the Pedal Organ, and the Pneumatic Action is also applied to the combinations of the Stops,* and to the opening and closing of the Swell louvres, &c. The Pedal key-board is radiating and concave. The stop-handles are placed at an angle of about 30 degrees.

Many parts of this Organ are similar to the Organs in Germany; but, on the other hand, it is remarkable for the number of similar Stops, not only on different Manuals, but even upon the same Manual. These are, of course, all of different scale and intonation, yet the German manner, in which the character of the Stop is declared, is preferable. The number of Reed-stops, compared with those of German Organs, is very considerable, and must give more of a Harmonium character, than the flute-like quality of German instruments.

* See page 57.

XIII. The Organ in the Town Hall, Bolton, built by Messrs. Gray and Davison, 1874, contains 4 complete Manuals, each from CC to c in altissimo, five octaves in extent, and a Pedal from CCC to g, two octaves and a half: and 48 sounding Stops.

PEDAL.

1. Double Open Diapason, 32 feet
2. Contra Bass, 16 feet
3. Bourdon, 16 feet
4. Violon, 16 feet
5. Clarabella Bass, 8 feet
6. Violoncello, 8 feet
7. Trombone, 16 feet
8. Trumpet, 8 feet

CHOIR (LOWEST MANUAL).

1. Bourdon, 16 feet
2. Violin Diapason, 8 feet
3. Vox Angelica,* 8 feet
4. Lieblich Gedackt, 8 feet
5. Flauto traverso, 4 feet
6. Piccolo, 2 feet
7. Echo Dulciana Cornet, 5 ranks†
8. Trumpet, 8 feet

GREAT (SECOND MANUAL).

1. Double Open Diapason, 16 feet
2. Open Diapason, 8 feet
3. Viola, 8 feet
4. Claribel Flute, 8 feet
5. Principal, 4 feet
6. Flûte Octaviante, 4 feet
7. Quint Mixture, 2 ranks
8. Great Mixture, 5 ranks
9. Double Trombone, 16 feet
10. Harmonic Trumpet, 8 feet
11. Clarion, 4 feet

SOLO ORGAN (THIRD MANUAL)

1. Concert Open Diapason, 8 feet
2. Flûte Harmonique, 8 feet
3. Flûte Octaviante Harmonique, 4 feet
4. Cor Anglais,‡ 8 feet
5. Clarionet and Bassoon, 8 feet
6. Tuba Mirabilis, 8 feet
7. Carillon (Bells), 4 feet

SWELL (HIGHEST MANUAL).

1. Lieblich Bourdon, 16 feet
2. Open Diapason, 8 feet
3. Viol de Gambe, 8 feet
4. Voix Célestes, 8 feet
5. Lieblich Gedackt, 8 feet
6. Salicet, 4 feet
7. Nazard, $2\frac{2}{3}$ feet
8. Flautino, 2 feet
9. Mixture, 3 ranks

* A very delicately-voiced Dulciana.
† A very small scale mixture.
‡ A *free-reed*.

10. Vox humana, 8 feet
11. Corno di Bassetto, 8 feet
12. Hautbois (Orchestral), 8 feet
13. Trumpet, 8 feet
14. Clarion, 4 feet

COUPLERS.

1. Swell to Great
2. Solo to Great
3. Swell to Choir
4. Solo to Choir
5. Swell Sub-octave; on its own Key-board
6. Swell Super-octave; on its own Key-board
7. Solo Sub-octave; on its own Key-board
8. Solo Super-octave; on its own Key-board
9. Choir to Pedals
10. Great to Pedals
11. Solo to Pedals
12. Swell to Pedals

Every Stop extends throughout the entire compass of each clavier.

The Pneumatic Lever is applied to the Great, Solo, and Swell Manuals. There are two Tremulants, one to the Swell Reeds, and the other to the *Cor Anglais*, and the *Clarionet*, in the Solo Organ: these two latter Stops are enclosed in a separate Swell-box.

There are two Swell Pedals, which can be arrested in their action at any point desired.

Instead of 'Composition Pedals' to push the Stop-handles backwards and forwards, *Ventils* are used to admit the wind, or shut it off from various sections of the Organ, without moving the Stop-handles. The Ventils, of which there are seven, are operated upon by means of a series of small Pedals.

The *Carillon* is, a series of sonorous steel bars, producing sounds at once sweet, mysterious, and of extreme delicacy.*

* See page 86.

## CHAPTER XI.

### UPON THE CHARACTERISTIC DIFFERENCES OF THE MANUALS.

*Q.* Wherein do the Manuals differ from each other?

*A.* 1. In the number, and the size or scale of the Stops.

2. In the peculiar manner of the construction of the pipes in general, and especially in the species of the Stops.

A glance at the specifications in the previous pages shows that the Chief-Manual, or Great Organ, contains the largest number, and the most powerful of the Stops, including those of 16 feet: the second Manual usually has more than the third, and this has more than the fourth. This refers more particularly to German Organs, but in English Organs it is not always the case, the Swell often containing more Stops than the Great Organ; but many of them are *Solo* stops, and of a delicate nature.

It will be further noticed that certain species of the Stops appear in all the Manuals, and yet produce a difference in their effect. This arises from the peculiar manner of their construction; the different form of the mouth, and of the incisions in the lips, &c.; and the wide or narrow form of the bodies; all these impart to the tone of the pipes a distinct *character*. This has already been explained on page

24 and 58, as regards the Diapasons, &c.; it is therefore possible to give to each separate Manual a distinct and different character of tone: see page 3.

*Q.* Are there any particular Stops proper for each separate Manual?

*A.* The deepest Manual Stops occur on the Great Organ; for instance, the Bordun 32 feet, and the many 16 feet stops; few of which appear on the other Manuals. The *Nassatquint* is usually found only on the 2nd or 3rd Manual, and the *Rohrquint* $5\frac{1}{3}$ feet, generally occurs only in the 1st Manual. Certain Reed-stops, as *Vox Humana, Oboe, Clarinet, Physharmonica,* are found on the 2nd and 3rd Manuals, whilst the 1st Manual contains *Trumpet, Posaune, &c.* The Pedal of course includes its own particular stops, many of which are only found upon that clavier.

*Q.* Do we find groups of each species of Stops; for instance, the lip-stops, or the Reed-stops; placed on each Manual?

*A.* Never in old Organs: but often in modern ones: this may be seen on page 89 (St. Nicolai, Leipzig). Each Manual, except the 4th, is placed in two divisions; of which one contains the powerful Stops, and the Mixtures and Reeds; the other the lip-stops, so far as the entire plan of the Organ permits. By this arrangement it is possible by means of *Valves*, or *Ventils*, which are easily moved by means of treadles, *to shut off*, or to bring on, an entire group.

*Such combinations are much used in modern French Organs.*

## CHAPTER XII.

### OF THE ART OF REGISTERING.

*Q.* What is understood by this?

*A.* By the art of Registering is meant, so placing and employing the Stops in an Organ, as to display not only the most different degrees of power, but also the utmost varieties of tone-colour.

*Q.* Are there any fixed Rules for this?

*A.* The performance of most fundamental passages can be easily determined, after a study of each Organ, the quality of its Stops, and the effect of their combinations. The ability and judgment of the Organ builder is also shown in the introduction of groups of the various species of Stops, which may be used either singly, or in combination. In the Full Organ all the Stops are used, and all the Registers are drawn: but here some modifications take place. In the first place, all very delicate and soft stops can be omitted, because they do not add to the strength, sharpness, and brightness of the tone, and consequently consume wind needlessly; even an entire Manual, such as the Echo-work in large Organs of four Manuals, can be omitted from the Full Organ, because it does not add to the diversity of tone. In that case it must be considered, whether the tone requires brightness and sharpness, or fulness and *dignity*. The first is attained by the use of the

*Mixtures*, and the more acute open flue-work Stops, and the conformable employment of the brighter Reeds, omitting, for instance, the *Fagotto* 16 feet in the Manual, and also the several deep-toned stopped Registers, as *Bourdon* 32 and 16 feet, *Double-gedackt*, and similar stops; and also in the Pedal using, preferably, the more acute lip-stops with the Mixtures, and the *Posaune*, or *Trumpet*: and to ensure precision of tone and brilliancy the Pedal coupler can be used.

In the second case, to procure fulness of tone and dignity, the deeper-toned Stops must be employed, particularly stopped Registers, and also the deeper-toned Reeds, omitting the smaller ones of 1 foot, the acute 2 feet stops, and the smaller *Quints* and *Thirds*, also the more acute *Mixtures*, as the *Cymbel*, *Scharf*, and similar ones: in the Pedal the 32, 16, and 8 feet can be used, and also the deeper Reed-stops, omitting the more acute, as the *Trumpet* 8 and 4 feet.

*Q.* What stops are used when the medium, or moderate power of the Organ is required?

*A.* There are several varieties of this species of tone, and these can be produced by

1. The *Diapason* work up to the 2 feet, the other flue-work stops of 16, 8, and 4 feet; the *Quints*, omitting the very small Registers, such as *Thirds*, or *Tierces*: the deeper toned of the *Cornets*, then the *free-reed* stops; omitting all the *Mixtures*, the small 1 foot, $1\frac{1}{3}$ foot stops, and the *striking-reeds*.

2. The stops above mentioned, omitting the *Reeds*,

3. The stops above mentioned, omitting the Reeds, Cornets, Quints, and also perhaps the *Rohrquint* $5\frac{1}{3}$ feet; and, if a bright tone is required, omitting also some of the stopped 16 and 8 feet Registers.

4. The *Diapason* work, without the 2 feet; some other flue-work stops of 16, 8, and 4 feet, with or without the *Rohrquinte* and the deeper toned *Cornets*; more than one Manual may be employed. The Pedal stops must be in proportion to the others.

*Q.* What stops are used in playing soft passages?

*A.* In soft and delicate passages most of the 8 feet lip-stops can be used singly. They are however more suited for solo playing, and seldom used alone, because, in accompanying the choral music in Divine Service, a certain degree of fulness and strength is necessary in all the softer passages. A *Sanftflöte* (soft-toned flute), *Rohrflöte*, *Bordunflöte*, *Lieblich Gedackt*, *Gemshorn*; or somewhat more acute sounding stops, *Diapasons*, *Fugara*, may well be used alone; the *Gamba* only when it speaks well, and in combination with a *Flute*, or *Gedackt*. The *Quintatön* is not to be used alone, but only in combination with another stop, and this in case the *Quintatön* is well made. The softer Reed stops (supported by a *Flute* or *Gedackt* 8 feet,) are used to make a melody prominent, accompanied with weaker stops upon another Manual. In the Pedal a *Sub-bas*, or *Salicet*, with or without a soft 8 feet stop, as, for instance, *Gedackt-bass* 8 feet. To these stops a soft

4 feet may be added, giving distinctness and clearness to the tone.

The most varied and beautiful shades of Tone proceed from joining 2, 3, 4 stops of 8 feet.

By two stops the fundamental-passage is made distinct. Stops of similar size, or height, but of different intonation; for instance, to the *Gamba* should be added, not the *Salicet*, *Fugara*, but perhaps a *Gedackt*, *Rohrflöte*, *Bordunflöte*, and probably also *Gemshorn*; these enhance the beauty and richness of the tone; whereas stops of like measure and similar intonation impart no particular modification, but give either a great keenness or sharpness, or else a dulness to the tone: such, for instance, as combining a *Double-gedackt* and a *Double-flute*. Yet when one wishes to make a whole passage, or a single part, prominent, by using several cutting stops, some soft Stopped, and full-toned stops are employed by way of contrast. Lastly, it is often agreeable to use *Stopped* pipes (*Gedackte*), and *Flutes*, together with another stop, to make a part prominent; which would be too weak if used singly. Another good combination is produced by the 8 feet stops in the Manuals, with the somewhat penetrating *Violon* 16 feet, or the dull Sub-bass 16 feet, and a soft 8 feet stop on the Pedal.

*Q.* Which combinations of three or four stops are the best?

*A.* Here is manifested the variety of large Organs. The blending is best when it is done by means of *stops* of a different kind, or character of tone; for *instance, by combining* the *Gamba* with the *Flute*

Stops. Of like character to the *Gamba* species, are, the *Fugara*, *Salicional*, *Geigenprincipal*, *Harmonica*; of the Flute species, are, the *Gedackte*, *Gemshorn* and *Quintatön*, and in respect to the last the effect is particularly good. The following are some good combinations:

| | |
|---|---|
| Gamba | Gamba |
| Gedackt | Rohrflöte |
| Gemshorn | Gedackt |
| Fugara | Fugara |
| Bordunflöte | Gedackt |
| Gedackt | Rohrflöte |
| Salicional | Salicional |
| Gedackt | Rohrflöte |
| Gemshorn | Bordunflöte |

Geigenprincipal
Flöte
Quintatön

To all these combinations a Diapason (open) 8 feet, can be added, when a brighter and more open tone is desired.

Should the Flute character be required to be more prominent, the following combinations can be tried.

| | |
|---|---|
| Flöte | Bordunflöte |
| Gedackt | Rohrflöte |
| Gemshorn | Quintatön |
| Doppelflöte | Doppelgedackt |
| Gemshorn | Rohrflöte |
| Harmonica | Gemshorn |

These combinations only serve as intimations of what can be done. There are many particular shades and blendings of tone, which can only be produced on each different Organ, because, stops of similar names often produce different qualities of tone upon different Organs.

To the above-mentioned combinations a soft 4 feet stop, as *Rohrflöte*, *Spitzflöte*, *Gedackt*, *Waldflöte*, can be added with good effect. In contrast to this a good *Diapason* 16 feet, a *Bourdon* 16 feet, and, to produce a peculiar tone-colour, *Quintatön* 16 feet.

The correct proportion of the Pedal to this is, *Sub-bass*, or *Principal-bass* (16 feet Diapason), and *Violon*, in combination with *Gedackt-bass* or *Violoncello* 8 feet.

The 8 feet Reed stops can also be used in various combinations with other stops: but they are not so frequently used in playing music in many parts, as in the prominent rendering of a Melody. Which of the 8 feet lip-stops must be chosen as a support to the Reed, can only be proved by trying the Organ itself; observing, that each supporting lip-stop gives to the tone of the Reed a different colour, or quality. The stops of the Flute species are thus chosen, because they moderate or soften the sharp tones of the Reed stops, and, as above mentioned, stops of opposite character should be combined together.

A good effect is also obtained by combining the soft 4 feet stops, and playing an octave below. If an 8 feet stop is added to these it produces the

effect of a 16 feet. The tone of this combination is often of great beauty.

*Q.* Are these suggestions on the art of Registering, sufficient?

*A.* In general they are, but not in certain especial cases, where a precise knowledge of all Organ Registers, their effect, and a study of each particular Organ is required. As for the rest, some knowledge of Organ playing is presupposed; but it is necessary attentively to observe the effect of the stops themselves, and also, at the same time, study the art of combining them.

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## CHAPTER XIII.

### GENERAL PRINCIPLES ABOUT PLAYING ON THE ORGAN.

*Q.* What is necessary to be understood in playing on the Organ?

*A.* Firstly, the *technical* management of the Manuals and Pedals: and Secondly, the *Æsthetic* branch of the science.

*Q.* What are the rules for the technical management of the Organ?

*A.* This work is not intended to be a complete Organ school, but the following are a few of the most general principles and rules for the study of Organ playing; which depends upon the cultivation of a *proper touch.*

*Q.* Is not the touch of the Organ the same as that of the Pianoforte?

*A.* No. By a proper touch or *stroke* upon the Pianoforte, and its different modifications of lightness, and intensity, the most varied shades of sound are produced by means of the Hammer. On the Organ it is more a *pressure* upon the Key, which must be quite decided and precise; and yet it will not be able to affect the modifications of the sound. Another especial requisite in playing upon the Manuals, as well as the Pedal, is, the *continued pressure of the finger* (or *foot*), *upon the Key*, so long as the value of the note continues; on the Pianoforte, in some circumstances, this cannot always take place, or be possible, with the same precision. In music for the Organ, written more or less in the Contrapuntal style, and in a progressive manner, with the different stops marked, the melodious coherence of the passages is broken or rent, by raising the fingers at improper places. *Organ playing therefore requires the most accurate and careful Legato touch.*

*Q.* Is not Staccato playing made use of on the Organ?

*A.* The *Staccato* is occasionally used in Organ compositions, but it is accomplished in a different manner to that upon the Pianoforte. A quick, elastic stroke upon the Organ brings only a bad, imperfect tone, the effect of which, by repetition, is very disagreeable. The Staccato upon the Organ is *best produced* by the pressure of the finger upon the

key (not by striking the key), and after holding the key down a short time, withdrawing the finger rapidly and with precision.

A good effect is produced by playing a melody with one hand upon a clear, distinct speaking stop, and with the other hand playing the accompaniment in chords, a little staccato, upon a softer stop, and on a different row of keys.

*Q.* Does the Organ require any particular method of fingering?

*A.* The rules for fingering upon the Pianoforte are, upon the whole, equally suitable for the Organ; there are, however, some peculiarities which are permitted, when playing strictly *Legato*. The exchange, or quick substitution of one finger for another, is much more frequent, and it is also indispensable; as the legitimate and suitable species of compositions for the Organ, and the melodious nature of each single stop, require a strictly Legato style of playing, and a fast-holding of the finger upon each key.

*Q.* Is playing on the Organ injurious to the touch of a Pianoforte player?

*A.* The touch of the Organ was formerly* heavy, and much force was required to put down the keys; but now the touch of a properly made Organ Manual should resemble that of a Grand Pianoforte, and it is gradually becoming known and recognised, that Organ playing tends to develop a true *Legato* style of playing upon the Pianoforte.

* See page 147.

Students who make the Pianoforte their chief study, take, simultaneously with their finishing Pianoforte lessons, other lessons on the Organ for the sole purpose of improving their *Legato* touch upon the Piano. Schumann recommended Pianists 'to neglect no opportunity of practising on the Organ;' and the same opinion was held by Mendelssohn, who was not only the finest Organ player, but also the most skilful Pianist of his day.

All who wish to excel as Organ players should by no means neglect the study of the Pianoforte, but combine it with their Organ studies.

*Q.* What is to be observed in playing the Pedals?

*A.* The Pedal keys, large, and proportionally broad in their shape, require not only a pressure, but a firm precise tread of the foot; only this must not degenerate into a violent kick or push; partly, because this will not attain the desired end, and also, if the action of the foot is too violent, the mechanism of the Pedals is very easily put out of order. In other respects the Pedals must be played Legato like the Manuals, the feet moving over the keys in a loose and easy manner. The deeper sounds of the Organ being always somewhat slow in displaying themselves, the staccato is seldom used in the Pedals, and the very short staccato does not produce a good effect.

*Q.* Describe the method of playing the Pedals?

*A.* The methods of using the feet upon the Pedals

are various, and the rules are less strict than those referring to the fingering upon the Manuals.

The points of the feet are usually made use of in putting down the Pedal-keys, and the heel is also used where it is necessary; as, in two adjoining keys one following the other, one of which is an upper, or short key; and the other an under, or long key; both may be played by one foot. Some teachers assert that entire groups of notes forming a passage or melody should be assigned to one foot only, so that the left foot is chiefly confined to the lower octave, and the right foot to the upper octave of the Pedal keys, the feet being used alternately when several of the longer or natural keys occur successively.

Probably the best method is, that for any fundamental passage or group of notes in each octave, the feet should be employed alternately, and the toe and the heel used, according to the position of the keys, and only at the proper places: a conformable employment of the foot being afterwards possible, by a skip to the right or left. By this method dexterity of the feet, in every way, is attained; and by a firm tread with the point of the foot, the tone is precise, and defined. This also avoids the defect of being only able to use the feet in one particular part, or on certain keys. The alternate use of the feet upon the upper keys, and upon the extreme point of the Pedal, is at first inconvenient, but after some practice it is accomplished without much difficulty, and passages of this kind are very easily played, especially with the use of the heel in certain places.

To play the Pedals correctly in the Legato style, it is often necessary to change the feet, and substitute one foot for the other. If, for instance, an ascending passage of this kind, C—G—e, is to be played Legato in moderately quick time, the C is played with the left foot, G with the right foot, the left being afterwards substituted for it, without again striking the key; and e is then played with the right foot. Should wide intervals of this kind be taken in quick time, it requires, of course, very great dexterity to perform them smoothly.

*Q.* How is certainty and skill acquired in this method of playing?

*A.* Every Organ piece should, in the Pedal, at least closely resemble the leading subject, or melody; and this must be well practised: otherwise, it is easy to stumble over a passage, and the performance will then be inaccurate and defective.

Thus much about the *Technical* part of Organ playing: it remains to give some observations about the *Æsthetical* branch of the subject. And this leads us to speak of the principal aim of Organ playing.

*Q.* What are the principal purposes of Organ playing?

*A.* They are:—

Playing for Divine Service,

Playing for Concert-expositions, and

Playing an Accompaniment; this also occurs in *the two* former cases.

*Q.* What are the requisites especially necessary in Organ playing, during Divine Service?

*A.* They are: *Suitable accompaniment of the Congregational Singing*, and the *Free Fantasie*, or *Improvisation.*

*Q.* In what consists a suitable accompaniment?

*A.* It implies, not only technical facility, but also especially that particular aptness which every accompanist should possess. It is important, therefore, that the Organist should rightly lead, or conduct, the Choral, or the sacred melody sung by the Congregation. He must not only play over the Choral (or, *give it out*, as it is called), in the correct time, but also endeavour to guard against a slow, dragging, style of singing, which a long Choral performance in unison so easily falls into, by its heaviness and unwieldiness. This must be done without any attempt at hurrying, which only causes interruptions and accidents. Further, it is necessary to have a perfect cultivation of the theory of harmony, and adroitness in its use. Then, at proper places, it is quite conformable, in order to avoid monotony and weariness, to alter the chords or harmonic-succession, and not constantly make use of the same harmony. But all this must be done with judgment and moderation, without interruption or disturbance of the Choral song or melody, and without exciting too much attention. The Organist should so play, that by his artistic performance the attention should be directed, not upon himself, but

upon the subject itself, by which means alone the right effect is produced. In many places it is customary, and is also considered proper, to have Interludes (*Zwischenspiele*) inserted between the lines, and strophes, of a Hymn; these must be suitable, short, and quite subordinate: not designed to attract particular attention, but only to connect musically one part of the Choral song with another.

*Q.* In what manner can the Organ accompaniment be accommodated to the meaning or purport of the Sacred song?

*A.* By an employment of proper Harmonies, and principally by a characteristic manner of accompanying by means of the Art of Registering, already alluded to in Chapter 12. These must be agreeable to the general meaning of the Hymn, and of the single strophes. It is evident—to mention only one instance—that in a song of praise and thanksgiving, more, and stronger stops, must be used, than with a penitential or mournful song, which is best when accompanied with fewer and softer stops. But if an entire Choral song is accompanied either with absolutely noisy, and strong stops, or, on the other hand, with very soft stops, it bespeaks a defect in an Æsthetical sense. These changes of Stops may either take place by single verses, or by entire strophes. On the contrary, a continual changing of the Stops at each verse, is to be censured; and the too frequent use of strong contrast, for instance, such as a sudden transition from a loud to a very soft tone.

This, in the accompaniment of Chorals, is objectionable, because it easily turns the attention from other things, and, in a healthy mind, often stirs up many unpleasant feelings.

*Q.* Which, then, is the right manner?

*A.* A whole Choral-song, or Hymn, should never be played with the same Registers, but alterations made at suitable strophes; the changes of the Stops not being made at each single verse.

It must, moreover, be observed, that in suitably leading or accompanying the Song of a large Congregation, more, and stronger Stops must be used, than in a smaller assembly.

*Q.* What is understood by a Free Fantasie?

*A.* The art of inventing and performing a Composition at one and the same time. To perform on the Organ extemporaneously, without premeditation: observing at the same time the rules of Harmony, &c.

*Q.* What are the means of accomplishing this?

*A.* A complete technical knowledge of Harmony, Counterpoint, and Composition: the ability to invent musical ideas, and the skill and experience to present them instantaneously in a suitable form. Where these requisites do not exist, or, if they do exist, but only in a limited degree, the Free Fantasie is shapeless and without any meaning; moving only in naked progressions of chords, or insipid phrases.

*Q.* How can this deficiency be overcome?

*A.* First of all a fundamental technical study of good compositions is to be recommended: then a

recollection of past experience, and practising upon a free and self-chosen *Thema* or *Subject*, contrapuntally worked out; by ample exercises varying this for different stops, and skilfully preserving a certain course of Modulation: neither modulating through all possible keys, nor monotonously remaining in one key only. Insight into the character of a composition, and diligence exerted in the repetition of experiments, are certain to lead to a favourable result. In place of the Free Fantasie, suitable Organ pieces may be chosen as models, either those of an elaborate character, or shorter ones of a more plain and simple kind.

*Q.* In what part of Divine Service may the Free Fantasie be introduced?

*A.* Generally at the commencement, or what is called the Opening Voluntary: in some churches it is used as an Introductory Prelude to the Hymn tunes; at other parts of the service where a longer or shorter prelude may be required; and also at the conclusion. At the beginning and the end of the service the Voluntary may be somewhat lengthened, but it must still be kept within certain limits.

*Q.* What is the Musical Form in which the Free Fantasie usually appears?

*A.* If it is not a plain and simple playing of a few chords and modulations, it generally takes the form of a Prelude, or an Introduction to a Choral, or to a Fugue, or a Fugue itself. Of the various species of Preludes and Choral-introductions, it is not necessary

here to speak at length, but a few observations may be made respecting the Improvisation of a Fugue.

*Q.* Is it possible to Improvise a Fugue?

*A.* To write a Fugue is one of the most difficult problems in Theory and in Composition generally, and to improvise a Fugue implies a higher degree of skill; it is therefore clear that this is seldom accomplished. That it is done by some highly gifted Organists proves the existence of all the conditions for success.

*Q.* What are these conditions?

*A.* First of all, complete information in the Contrapuntal style; and in the melodious carrying on of each part: freeness in extemporising: readiness in holding firmly a fixed Theme or Motivo, and leading it, alternately, through all the parts: and especially, a complete knowledge of the Fugue form, and the skill to employ this instantaneously as opportunity requires.

*Q.* How is this readiness to be attained?

*A.* The Art of Composition must first be studied with a good Master, and Fugues and other pieces written in the Contrapuntal style must be played; then, in the Free Fantasia, constantly attempt to imitate these, and, in playing, avoid as much as possible harmonical-homophony, always firmly sustaining a fixed *Thema.* By sufficient practice and certainty herein, one can confidently proceed to the formation of the first *Subject* of a Fugue, after which the knowledge is necessary for the right formation of

the *Answer*. Then succeeds the first entry of all the parts in a proper and correct manner; and this is an important step accomplished.

*Q.* What is meant by the *Answer* in the Fugue?

*A.* This name is applied to the *second* voice or part, which imitates the *first* part called the *Subject*. Then the third part, like the first, takes the *Subject*, and afterwards the fourth part follows with the *Answer*.

*Q.* Wherein consists the difficulty of forming the Answer?

*A.* The Answer is a strict imitation of the Subject, in the 5th above, and, as such, is not in all cases difficult. Yet, according to fixed rules, there are often introduced in the Answers certain deviations from the strict imitation of the Subject itself, and these can only be learnt by studying the Theoretical part of Fugue writing. In this place allusion can only be made to it.

*Q.* Why does not the simple imitation in the Fifth suffice, and why are such deviations permitted?

*A.* These deviations, as before mentioned, do not always occur, but only in certain cases. Without them the characteristic of the Fugue is lost, which in the Answer requires, not a mere imitation only, but the imitation must have a distinct reference and dependence upon the Subject.

*Q.* What is further to be observed in each part, *in the* composition of a Fugue?

*A.* After the correct introduction or entry of all the parts, the further management of the Fugue may be very various, there being no fixed rules for any particular course of Modulation, excepting, that great deviations from the key-note must not take place. It is, above all, self-evident, that the entry of the subject of the Fugue must be prominent. Near the end occurs a series of harmonic progressions or imitations upon a Pedal note, which is called an *Organ-point;* and after this is the *Stretto.*

*Q.* What is understood by the Stretto?

*A.* The Theme, and the Answer, are introduced in all the different parts, at very short intervals, each entering immediately after the other.

*Q.* What is to be observed at a concert performance upon the Organ?

*A.* Perfect technical facility, and a complete mastery of the music to be performed. The peculiarities of the Instrument, and also of the Room or Hall in which the performance takes place must be understood: these often have too little attention given to them, therefore a few remarks may not be superfluous.

One of the first conditions is, that the Organ piece to be played should be equally suited to the place and to the Instrument.

*Q.* Wherein consists this peculiarity both of the Instrument, and of the Place?

*A.* Principally in the resonance of the sounds of

an Organ, which, naturally, is greater in proportion to the larger size of the Organ, and the greatness of the space. These are both so little taken notice of that the effect of an Organ cannot be fully judged by one performance, it being different altogether when heard in proximity, to the effect at a distance.

*Q.* What is to be noticed in reference to the Resonance of the sounds?

*A.* When each sound of an Organ in a favourable position, re-echoes a long time, there arises from the playing, if too rapid, an intermixture of sounds, which either partially or entirely obscures the distinctness of the tone. In order to avoid this indistinctness, which, by clearness of touch, and proper division of the parts, should not happen, the Time, or rapidity of the Music, should be especially chosen and considered.

To music in a slow time this remark naturally has no application, but music in quicker times usually requires a strong Registering by means of Mixture stops, and constant attention to the reverberations of large spaces, if a good and suitable effect is to be produced. Rapid time, which, with the Pianoforte itself produces a bad effect in large spaces, can never suit the Organ; and the same music, played upon both instruments, requires, in each case, to be played in a different time.

*Q.* What are the disadvantages if the Time is wrongly chosen?

*A.* As mentioned above, by the entire want of

clearness the progression of the parts appears to be only a rustling of tones, in consequence of the great intermixture of the sounds, so that the ideas never can come out clearly, consequently the effect upon the hearer, particularly when the music is not already familiar, is as if something were wanting; and the usual agreeable acknowledgment is seldom given to the performer. This mode of execution is especially faulty as regards those Organ pieces that deserve the name of artistic compositions; while other smaller and less important works, which are often of an unmusical and indistinct character, and without ideas of a pleasing form, cannot be made clear by means of even the best execution.

*Q.* Has not the Registering also great influence as regards this?

*A.* Very much. In Organ pieces of a lively character and *tempo* the Full Organ, as a rule, is generally employed, so that it occurs, not seldom, that all the Stops of an Organ are heard. The expression *Volles Werk*, however, when used by Bach, &c., does not always mean, that every Stop in an Organ is to be employed. It depends chiefly upon the character, and the species of the Organ piece, whether one is preferably to use the deeper, fuller, stops; or the bright, acute, mixture stops; and the selection has to be made, which of these stops should be chosen. So it is with one of the great Organ Fugues, that contains many rapid passages, and requires bright, acute stops, in playing; and in

which many of the duller 16 feet stops in Manual and Pedal can be left out; whilst in another containing measured and quiet progressions, probably many of the lighter and smaller stops, and the mixtures, could be spared. But if, for instance, the familiar great Fugue in G Minor, of S. Bach, were played upon a very large Organ with all the Manual Stops throughout, and even in the Pedal with the *Posaune* 32 feet, it would neither display good taste, nor a knowledge of the effect of an Organ.

*Q.* Why cannot, in this case, the *Posaune* 32 feet be used?

*A.* Because this Stop, in speaking, is much too ponderous, and there is always some rolling of the tone; therefore, in the quick passages which occur so frequently in the Pedal, the time allotted for each note is so short that it would not have time to sound, but it would have an interrupted effect, like a series of gaps; or, if it did happen to sound promptly, the effect, in a rapid passage so unsuited to its character, would be heavy, if not absolutely ludicrous.

*Q.* When can the *Posaune* 32 feet be used in a suitable manner?

*A.* If the bass moves in bold, vigorous passages; or phrases of sustained notes, and in moderately quick progressions, some of the passages may be selected in which the Posaune 32 feet may produce a good effect, and not a heavy one. No composer ever writes an Orchestral piece, to be performed *fortissimo*,

in which an instrument like a *Bass Tuba* would have to play rapid passages, in a confined space.

A few short remarks may be made upon Organ playing as an accompaniment.

*Q.* What particular manner of accompanying is here meant, in addition to that already mentioned?

*A.* The accompaniment of Solo, and Choral Singing. In this the design is to adapt the Organ to the soft and the loud tones of the singer. No accentuation is generally possible on the Organ, therefore, in reference to the Solo singer very much depends upon suitable Registers being chosen. The proportionally resonant sounds of even the softer stops, have, by their intensity, something very firm and penetrating, which in the accompaniment of a single Solo voice is much too prominent. It must, therefore, be very weakly Registered, as it can very easily produce a disadvantageous effect by a single Register too much. As regards the softness of the Stops one must not err as to the effect of their sounding at a distance, which is more than when near one imagines they would, and the value of the notes is better ascertained with soft Stops than with Stops which easily cover the voices. At proper places, as also in the intermediate passages, one or two other soft Stops can be added to increase the tone, and produce a difference of effect. It is best to judge of this, not in proximity to the Organ, but at some distance. In the accompaniment of the Choral-song the same principles of Registering,

only in rather stronger measure, must be kept in mind; whereby many gradations of tone are possible, by attention to the proper character of the music.

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## CHAPTER XIV.

### UPON THE PNEUMATIC LEVER; OR, THE PNEUMATIC-WORK.

*Q.* What is the meaning of the Pneumatic Action?

*A.* It means: *Action put in motion by the wind*: or, a *Lever set in motion by means of the wind.*

*Q.* Upon which part of the Organ does this Lever act?

*A.* Originally it acted only on the keys, but it is now made to act upon the draw-stop action, the composition Pedals, the Couplers, &c. It is a mechanical contrivance to lighten the touch, &c.; and to overcome the resistance of the wind; and works by means of a system of backfalls, trackers, pallets, &c.

*Q.* Does the touch require to be made lighter?

*A.* The larger the size of an Organ is, so many more Stops require to be drawn at the same time, and to sound together; therefore, as a larger proportion of wind is necessary, the pressure of it is

consequently so much stronger. In the coupling of the Manuals the touch is often rendered very heavy, by some of the trackers leading to a distance. Skilful Organ builders have endeavoured to overcome this difficulty, but have only partially succeeded, until an Englishman named Barker, about 1832, invented the Pneumatic action; and this is, now, always applied in large Organs.

If, while playing on one Manual, the other Manuals are coupled to it by means of the Pneumatic Lever, the touch does not become any heavier, but remains as light and easy as if the finger were pressing down the keys of one Manual only.

*Q.* By what means is the power of the Lever produced?

*A.* As the name signifies, *by means of the Air.* The mechanical arrangement of it consists of an oblong, closed, air-tight, wind-chamber, which, by means of a separate bellows, is filled with air, and which must be at a high pressure. This wind-chamber has as many air-tight partitions as there are Manual keys. When the pressure upon the key commences, a *conical pallet*, something like that described on page 41, rises up and leaves an opening into the wind-chamber: through this the air rushes and presses upon a second lever, resembling a small *concussion valve*, which, by means of a *square*, pulls down the *tracker*, or the key of the other Manuals. There are, therefore, as many of these small concussion valves, as there are keys on the Manual.

Fig. 22 is a sectional representation of a part of the pneumatic action belonging to *one* key: the action of the other keys is similar. The representation is two-fold, and exhibits two different applications of the pneumatic action, either of which may be employed, according to the judgment of the Organ builder.

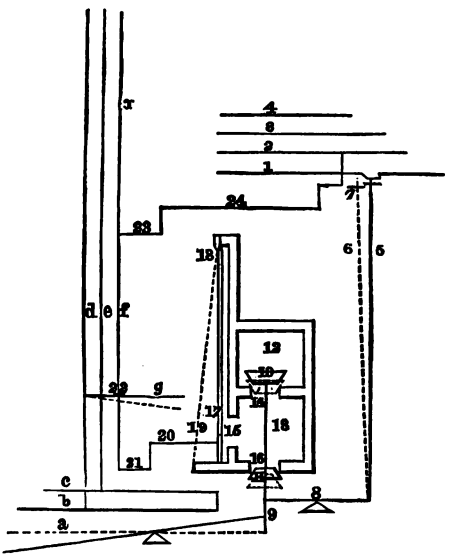


FIG. 22.

The following will more clearly explain each *part* of the above:—

*a*, *b*, *c*, the keys of an Organ of three Manuals, the lowest of which, at 9, leads to, or is connected with the pneumatic work: the Full Organ can, here, only be played by means of the pneumatic action.

*d*, *e*, *f*, *Trackers* or *stickers* belonging to the different Manuals; *d*, *e*, are immediately connected with the second and third Manuals; *f* is connected with the lower Manual, by means of the pneumatic action only.

*g*, Coupling arrangement for all the Manuals, the dotted line denoting the position when uncoupled: the remaining part of the pneumatic-work acts here in the same manner as explained by the figures below.

The other part of Fig. 22 represents a different action of an Organ, *from above*, as shown by the following:

1, 2, 3, 4, the four Manuals of an Organ.

5, a *Sticker*, coupled to the lower Manual.

6, the same *Sticker*, showing, by the dotted line, its position when uncoupled.

7, the *slide* or *register* in which the Sticker is placed; showing it as pushed behind, or uncoupled.

8, a *backfall*, which *turns* or *balances* itself upon the Δ: this backfall leads to

9, a *Tangent*, or *Sticker*: and also to the pneumatic-work proper.

10, 11, *Valves*, which are designed to open and to close

12, 13, two *reservoirs*, air-tight chambers, which

either hold the wind, or let it out, by means of the two valves.

14, 15, 16, Openings for the current of the wind: 12 contains the air, from the separate bellows, at a high pressure; by the opening of the valve 10 the valve 11 is closed, and the wind rushes through 13 to the opening 15.

17, *Plate*, or *board* of a small concussion-valve.

18, *Parchment hinge* to the *plate* 17.

19, Dotted line, showing how far the concussion-valve opens when filled by the pressure of the air.

20, a *Tracker*, reaching to

21, a *Square*,

22, a *Tracker*, which, by means of

23, 24, a *Square* and *Tracker*, leads to, and is connected with the Great Organ Manual 2, to which the other Manuals can be coupled.

In both methods the pneumatic-work is only put into operation by playing on one certain, fixed Manual.

*Q.* Describe the method of its working?

*A.* By the pressure upon the key *a*, which rests and is balanced upon the △, the two valves 10, 11, are pushed upward. Then the compressed air in the chamber 12 escapes into the second air chamber 13, which by means of the lower valve at once becomes shut close; this air presses through the opening 15 upon the plate 17, and opens the concussion-valve about 6 inches wide, as far as the dotted line 19. This plate is in combination with

the tracker and square 20, 21. By means of 22 the combination with the trackers *d*, *e*, of the second and third Manuals is effected, and these are drawn down through the pressure of the plate, by means of the square and tracker 20, 21. At the dotted line *g* the place is intimated, when the coupling is complete. The other Method is for an Organ of 4 Manuals, as in the 'Nicolai Church,' in Leipzig, and represented in the upper part of Fig. 22: it works from the lower Manual, by means of the protuberance at the under part of the key.

When the key 1 is pressed down, the *sticker* 5 presses the one end of the backfall upon the *balance* 8, and by this the two *valves* are raised, as in the other method. The *plate* 17 presses upon the *square* 20, 21, and this draws down the *tracker* f, and in like manner by means of the square and tracker 23, 24, the key of the 'Hauptmanual' or Great Organ 2, is drawn down: to this the other Manuals 3, 4, can be coupled in the usual manner.

If the pneumatic lever is not used, the *sticker-slide* 7 is pushed behind, or uncoupled, as represented by the dotted line, and thus the key does not move the sticker 5.

The pneumatic lever varies slightly in its details, as made by different Organ builders, but the principle and the plan are the same in all.

## CHAPTER XV.

### UPON INTONATION, TEMPERAMENT, TUNING, AND THE SOUNDS OF THE ORGAN.

*Q.* What is understood by the Intonation of an Organ?

*A.* The *Intonation*, or *Voicing* of the pipes, is, attention to the acuteness, or the depth, of the tone, and its purity; the careful conformation of the mouth of the pipe; setting the lips; regulating the quantity of wind, and properly conducting it through the pipe; and other matters of great delicacy relating to the character and speech of each particular Stop.

*Q.* Is not the acuteness, of *pitch*, already determined by the measure or length of the bodies* of the pipes?

*A.* The definition of the *pitch* of the pipe by its measure, is only proximate, and is the *standard* or *apparent* length of a pipe: the *literal* or *exact* length may fall a little short of that measurement, or, in some cases, rather exceed it: this may, for instance, depend either upon a stronger, or a weaker, supply of wind, which would require a longer, or a shorter

* In speaking of the length, the *body* of the pipe is alluded to; the *foot* is not taken into the calculation, as it is only the *supporter*, and a wind-channel to the pipe.

pipe, to produce a sound of the same pitch: variation in the scale, or the outline of the pipe, &c. must also be taken into consideration.

*Q.* What are these variations in the scale, and the different character of each Stop?

*A.* A pipe, A, or C, for instance, is brought into perfect pitch or tune by means of sounding and comparing it with some wind instrument, as the Oboe, or Clarinet; this is done by more or less lengthening, or shortening, the body of the pipe. The character of the tone is then attended to by carefully regulating the size of the mouth, under-lip, &c. When this is accurately determined, the other pipes, by 5ths, 4ths, and Octaves, are tuned exactly in accordance with the same Temperament. A row of pipes thus tuned and regulated, — usually the *Principal* 4 feet,—then serves for laying the *foundation-tones* of all the other stops; after which, all the remaining pipes of each row are tuned in unison or in octaves; and perfect purity of tone is then attained, when in two different stops there are no wavings, or jerks of the wind observable.

By lengthening the body of the pipe, the tone naturally becomes deeper; and by shortening it, the tone is more acute. The first is difficult, and only possible by joining, either tin, metal, or wood, according to the species of pipe; the other is easier, and is done by cutting off a part of the rim. The pipe is therefore, at first, always somewhat longer than the precise measure. In the 'front' pipes,

large holes or slits are often found cut out at the back, because, in order to preserve the symmetry of the pipes no cutting off at the rim can be permitted, and therefore the cutting or slitting is at the back of the pipe, and this produces the same effect as slightly shortening it. Thus the tops of the pipes of different sizes are seen perfect, in the 'front' of an Organ.

*Q.* What is the *pitch* of the Organ tone?

*A.* Formerly there was no Normal pitch, but several different pitches, or *tunings*, were in use; and this was also the case with the Organ, and was especially annoying when it had to be combined with the Orchestra; and the difficulty was often impossible to overcome.

At the present time the unity and equality produced by the new Parisian Normal pitch, is most desirable. This can only be very slowly followed by Organ builders, because to re-tune an Organ over again to another pitch, involves much trouble and expense.

Formerly there were two kinds of tuning for the Organ; one called the *Chorton*, or *Choir-tone*; the other the *Kammerton*, or *Chamber-tone*.

The *Chamber-tone* is the same as the usual Orchestral tuning or pitch: the *Choir-tone* is a whole tone higher. The latter originally arose out of the deficiency of any fixed pitch or tuning; but later, from the interest of Organ builders, and also from the want of energy of the Organists, it has continued *until* recent times, and has occasioned much incon-

venience, and been a great disadvantage. This tuning is found in many old (German) Organs.

*Q.* What interest has the Organ builder in the *Choir-tone?*

*A.* It avoids the use of one or two of the deepest and largest pipes, which, in many, and especially in the value of the material, of the deepest stops of 16 and 32 feet, amounts to a considerable sum. In Organs recently built, this abuse is rarely met with.

*Q.* What is meant by the Temperament of the Organ?

*A.* The Temperament is that understood by the tuning of the Intervals in modern music, by which, as on the Pianoforte, it is possible to play in all keys; the single Intervals, especially the 5ths, not being tuned absolutely pure or perfect; the small difference being, to the ear, scarcely perceptible. This tuning is now in general use, and is called the *Equal Temperament.* Formerly Organs were tuned in the *Unequal* Temperament, and then it was only possible to play in some particular keys, which were more perfectly in tune than the others.

*Q.* Why is it necessary to tune the Organ again, at a second and distant time?

*A.* From the alterations of the weather, cold and heat, humidity and dryness; from its frequent use; from dust collecting in the pipes; and also from casualties; which so affect the pipes, that an impure tone arises.

*Q.* How is this second, or after-tuning, effected?

*A.* In the tin and metal lip-pipes, which are not themselves easily put out of tune, this is effected by compressing, or by bending out, the upper rim or edge at the top of the pipe: it is seldom that any cutting of the rim is required. In the tuning a funnel or cone-shaped instrument is used, called a *Tuning-horn*, or *cone*, made of brass, or wood and brass.

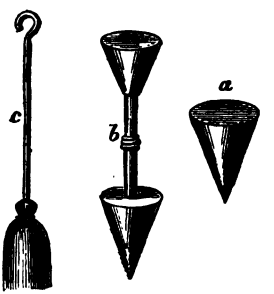


FIG. 23.

*a*, is shaped like a hollow cone, of brass.

*b*, has at one end a solid brass cone, and at the other end a hollow cone.

*c*, is a tuning-brush, or *mop*, used in tuning the Compound Stops, as the *Mixtures*, &c.; and it is put into each pipe of the given note, excepting the one about to be tuned, to silence them: just as in tuning Pianofortes, a damper covered with leather is used, to silence certain strings.

The tuning-horn *b* is the best kind, because it

can be easily used by means of the wooden handle in the middle. They are used of several different sizes.

Should the tone of a pipe be a little too flat, the pointed part of the cone is pressed into the top of the pipe; this turns the edge a little outwards, and so slightly raises its pitch. If the pipe is a little too sharp, the hollow part of the cone is forced over the top of the pipe; this presses its edge inwards, and thus produces the same effect as slightly lengthening the pipe would do.

The tuning of the wood pipes is more difficult, as they are put out of tune by the dry wood imbibing moisture from the atmosphere. The cutting off, or adding to the length of the pipe, is not often done, where the difference of the tone is trifling: but the tuning is effected by means of a *metal tuning plate*, fixed into the upper end of the back of the pipe: this is bent down over the opening to flatten the pitch; and raised, to sharpen it. A large pipe is sometimes flattened by nailing a piece of board as far over the end of the pipe as is necessary.

Stopped wooden pipes are put out of tune by the weather, or some other cause, displacing the stopper. The stopper is then either pressed down deeper by means of a hammer, to sharpen the tone; or it is drawn up by its handle, to flatten it. Stopped metal pipes which have a movable cap, or capsule, are tuned in the same way. In England the cap is generally fixed, and the pipes are then tuned by the large ears, with which they are furnished.

*Q.* How are the Reed-pipes tuned?

*A.* These are more frequently out of tune than any of the other stops, and are easily re-tuned by means of the hooked-wire, described on page 32: on raising this wire, with the *tuning-knife*, the vibrating portion of the tongue is lengthened, causing it to give a deeper tone: on depressing the wire, the vibrating part of the tongue is shortened, and the pitch is consequently raised. If screws are used, as in Fig. 9 A, the tongue is screwed faster, or slacker, and thereby the tone is regulated.

*Q.* Besides the general principles as stated on page 133 for the tuning of the Organ, there are other contingencies assumed. What are those which most frequently occur?

*A.* In addition to the faults already named, the pipes often sound out of tune, when the *sliders* and the *trackers* belonging to the pallets, are not in their proper situations.

*Q.* How are the pipes put out of tune by means of the *sliders?*

*A.* If the Register is not completely drawn out, or if the wood of it is *warped* by drying up, then the slider partially covers the openings to the pipes, and thus they are not completely opened. The wind, consequently, cannot reach the pipes with its full strength, and in the necessary proportion; and therefore the Tone does not attain the exact acuteness.

*Q.* How do the *trackers* put the pipes out of tune?

*A.* The different joints of the tracker-work leading to the pallets, are, as well by their use, as through the weather, subject to many variations, and are either drawn together, or else become stretched out. The leather screw or button (see page 44), near to the keys, is especially subject to contraction and expansion; so that one key is drawn too high, and another is placed too low. If the keys are too low, and the touch too shallow, then the tracker, in consequence of the too little fall of the key when pressed down, does not completely open the valve, so that the wind has not sufficient strength to reach the pipes, and thus the tone is imperfect.

*Q.* What is the remedy for this?

*A.* By means of this leather button the position of the keys, and the complete openings of the valves can be regulated. If there is not sufficient room for the fingers to turn the button round, this can be effected by means of two files, which can be used between the trackers. A pipe is sometimes out of tune from being loose in its position. Each pipe must stand firm, so that no wind may escape at the foot; and also be firmly placed in the pipe-rack. (Fig. 11, page 38.)

*Q.* What is to be particularly noticed with regard to the changes of the weather?

*A.* Moisture and dryness operate chiefly upon single parts, and swell them out, or contract them.

Heat and cold, especially if they appear gradually, and not too suddenly, operate more upon the entire tuning, so that by the heat the whole pitch of the flue pipes becomes higher; and contrariwise, deeper by the cold: and this, although the difference may not be important, yet it can essentially differ from the Orchestral tuning. On the Reed Stops cold and heat operate reversely, so that by dry cold, the tone becomes higher; and by heat, lower.

*Q.* What is the reason of this?

*A.* Because the tongue, the steady elastic vibrations of which chiefly produce the tone, becomes harder, and more brittle, by the cold; and therefore makes quicker vibrations than in the heat, when the elasticity is less. This fault is only to be remedied by frequent tuning.

Many faults and interruptions of the kinds above mentioned, and stickings, when they do not occur from a defective part, often remove themselves in the course of a few hours.

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## CHAPTER XVI.

### UPON DEFECTS OR INTERRUPTIONS IN THE MECHANISM, AND THEIR REMEDY.

Many other Musical instruments, and indeed all mechanical works, are, while in use, liable to inter*ruptions* and stickings in the mechanism; therefore,

in so complicated a machine as the Organ this must frequently be the case. These defects are naturally extremely disagreeable, because they not only interfere with the efficacy of the instrument, but often unmusical noises, and troublesome single sounds break out.

*Q.* What are the most common faults that can occur, when playing on the organ?

*A.* They may be classed under two heads: the *ciphering*, or sounding of a single note, without any key being pressed down; this is sometimes called *howling*, or *humming*: and a key *refusing* to sound. Various causes contribute to both.

*Q.* What is the cause of the Ciphering of any Note?

*A.* It can naturally only happen if the pallet is not properly closed, and thus the wind penetrates to the pipe through any opening, be it ever so small. The cause then lies, either in the valve itself, which sometimes by unusually vigorous playing, and violent thumping upon the key, is jerked from its place, and remains hung upon the *direction-pins*; or, the pallet-spring may be jerked off, or broken; or a small substance, a grain of sand, chalk, lime, &c., may have fallen through a pipe upon the valve, and remain firmly pressed. between the valve and the *groove-board*; or the pallet-spring may be too weak; or the leather may be loosened by damp; or the pallet warped by heat.

Or it may be that a key is held fast somewhere,

usually by the Pedal, if the spring under the Pedal key is fractured, or jerked out of its place; a tracker or sticker may 'bind,' or remain in the hole in the register through which it should move; or a *pin* in the roller-board is bent; or the Rollers may have become crooked; or a pin may have become bent in the coupling action, &c. The cause of a ciphering is often as difficult to discover as to remove. A note ciphers, or makes a hissing noise, if one of the sliders becomes warped, and the noise disappears when more Registers are drawn. Sometimes when the Register is closed a humming sound is heard either in the Manual or Pedal, as soon as the Bellows are filled. All these faults, which are produced by various causes, are easily removed by an Organ builder, or other competent person, when the cause is found out. If the fault appears during the playing, it will produce embarrassment, as it is then difficult to discover the seat and the cause of the evil.

*Q.* What is to be done to remedy the defect at once?

*A.* First of all, by striking the key repeatedly the fault is sometimes gradually removed, but the key must never be struck too violently, otherwise a greater evil may appear. Should this not avail, the coupling may be removed or pushed in, as by changing the position of the various parts, the defect sometimes disappears. The different Registers may be pushed in, to endeavour to silence the ciphering, especially that Register in which the fault is supposed

to be. If the ciphering occurs in a whole chorus of stops, that Manual must be entirely shut off, as, if the evil is in the wind-chest, it cannot be got at immediately. If the Organ has only one manual, of course everything is heard, therefore, every Organ for public use should possess a second Manual, if only a small one. If the ciphering is in the Pedal, that part of the organ must be at once shut off. All this must be done quietly, without haste, but with decision; and in many cases the defect will disappear, at least for the moment. Afterwards, the reason of the defect can be sought for, and accurately ascertained, if one has any insight into the nature of Organ building, and supposing also that the evil does not lie too deep, and require to be restored by new mechanism. In this case the Organ builder alone can assist.

*Q.* What prevents a key sounding, when it is pressed down?

*A.* If this is only on one single stop, it usually arises from the obstruction of a pipe by sand, chalk, lime, or dust; or the top of the pipe may be injured by being bent, or otherwise damaged; the pipe may be out of its place; the Register, perhaps, not completely drawn out. If the note is dumb in all the stops, a screw, or a button, may have altered, so that the pallet does not open; one of the Trackers may be loose, this will be seen if the key falls down; the spring of a pedal-key may be broken, or torn loose, and the strength of the valve-spring not be sufficient to raise the key by means of the Trackers; a key

may itself be cramped or squeezed from different causes.

*Q.* What can be done, during the playing, or during the Service, to remedy these faults?

*A.* Little or nothing, whilst the performance, or the Service, is going on; they must be amended afterwards.

*Q.* Are there any other faults or interruptions likely to occur?

*A.* A note may speak badly, in any stop, or, on the contrary, may be too loud, or too late in speaking; a pipe may be *over-blown*, that is, it may sound its octave, or its fifth, instead of its proper sound; a note may tremble, rattle, or hiss. The reasons for all these faults are very various: a button may be screwed a little too tight, and easily discovered. Sometimes the Bellows are faulty; or they may be pushed down with an unequal and jerking motion, this will give the sounds a jolting, waving, or tremulous effect. These, and many other faults, can only be remedied by the Organ builder.

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## CHAPTER XVII.

### UPON THE ORIGIN OF THE ORGAN, AND ITS HISTORY.

*Q.* When was the Organ first invented?

*A.* The origin of the Organ is hidden in such *obscurity*, that neither can the century be named,

nor any account given of the inventor. At first, probably, a very simple contrivance, and of little significance, improvements were gradually introduced by the inventive human mind, in the course of ages, and extending over many centuries; still preserving the precise principle upon which the Organ is founded.

*Q.* What is this Principle?

*A.* No other than this: a number of pipes placed together, in single rows, or otherwise, with wind conveyed to them by mechanical means; and then by means of mechanical assistance making them sound by the wind thus conducted.

*Q.* What is the simple contrivance which appears to be the germ which has developed into the Organ?

*A.* The first of all musical instruments was undoubtedly the simple pipe or pipes formed out of reeds or rushes, the invention of which is lost in grey antiquity: there can be no doubt that this contrivance was made use of by the earliest pastoral people. The single, simple tone of such a pipe, naturally could not satisfy the most simple mind, and therefore the idea must soon have been conceived of placing several of these pipes of different sizes and acuteness, near to each other, and blowing into them one after another, and thus making them sound. Whether the idea was also then formed of producing sounds of different acuteness by means of holes in the pipe, cannot be considered here. This placing

together of different pipes may be seen on old sculptures, where 'Pan's-pipe' often occurs; in more modern times called 'Papageno-pipe.'

*Q.* In what manner may the Pan's-pipe be considered as the origin of the Organ?

*A.* By amplifying and carrying out the idea; placing several pipes near to one another, and blowing into them with the mouth, must have been most troublesome and onerous, and therefore artificial means must have been sought of leading the wind to them. At first the pipes probably were placed upon a wooden box, into which wind could be gathered by means of a reed or tube, and single pipes made to sound, whilst the openings of the others were covered, at first by the fingers; afterwards, when the number of pipes was augmented, by means of valves. This was the precursor of the present ordinary *wind-chest*; and the mechanical conveying of the wind gave an opportunity for the employment of the *bellows*; and thus the Organ appeared; and although rude and imperfect in form, it is the foundation of the modern Organ, and includes many of its essential points: the supply of wind by means of bellows, the aperture leading to each pipe having a *valve*, which either opened or closed the passage for the wind, by means of *cords* (whose place, at a later period, was supplied by *trackers*,) connected with wooden levers placed near together, which probably more or less resembled our *keys*, only much more clumsily formed; and the pressure of these levers opened the *valves*.

*Q.* What is supposed to be the period of these improvements?

*A.* No precise date can be given, yet it is clearly ascertained, that instruments of this description were in existence some centuries before the birth of Christ. Hero and Vitruvius describe a so-called *Water-Organ*, *Organum hydraulicum*, which Ctesibius, of Alexandria, invented or made, about 180 or 200 B.C., from which it is concluded that Organs of another species were already in existence; possibly the *Organum pneumaticum*.

*Q.* What is a *Water Organ?*

*A.* The water in this was not, as some have ignorantly supposed, the producer of the tone of the instrument, but only the Regulator of the wind, to remove the inequality of the sounds. The bellows of these early Organs were very small, and imperfectly constructed; consequently they did not produce a steady wind, and the tone was not uniform. We find, amongst the old writers, Hero of Alexandria, Vitruvius, Claudian, and Tertullian, descriptions of the Water Organ, which are not indeed very clear, but which describe it as having two closely shut reservoirs or chests, of which the one was filled with water, and connected with the other: it is not supposed that the water directly produced the wind, but that by means of counter-pressure, it gave the wind equality and power.

*Q.* When was the Organ first introduced into the Church?

*A.* This is not known, but it is conjectured that

it had already appeared in the Christian churches in France and England in the 9th or 10th centuries; and, according to a passage from Aldhelm,* Organs were in use in England in the latter end of the 7th and the beginning of the 8th century; and the external pipes were usually gilded.

The old Greeks and Romans used, as a means of entertainment at their feasts, an instrument called an Organ, but they applied this term to any kind of a musical instrument.

*Q.* How long did the Water Organs continue in use?

*A.* A tolerably long time; through many centuries; for they are mentioned in the eleventh century and even later.

*Q.* When did the Organ first appear in Germany?

*A.* It is well known, that the Byzantine Emperor, Constantine VI. sent an Organ to Pepin, the father of Charles the Great, about the year 757, which was placed in the church of St. Corneille, at Compiegne: this does not appear to have been a Water Organ; in 812 Charles the Great had another Organ built, after this model, for *Aachen*, probably for the Cathedral. This account is given by Eginhard, who, as is known, lived in the 9th century, and was Private Secretary to Charles the Great. The use of the Organ, therefore, in the church, in Germany, may be dated from this time.

After this it appears that the improvement of the art of Organ building was pursued with ardour in *Germany*, for Pope John VIII. had himself an Organ

* An Anglo-Saxon writer, who died A.D. 709.

out of Germany, in 880, and an expert Organ player sent with it. Probably this was the first Organ that was used in Rome: and after this precedent they must have been more freely admitted into the churches of Italy and France.

*Q.* Is anything known of the quality of these early Organs?

*A.* Little can be ascertained of them from the isolated descriptions. The number of the sounds was small, from 9 to 12 keys, the shape of which was rather coarse and large: they were an ell long, and from 3 to 5 inches broad, and were not pressed down with the fingers, but struck with the *fist* of the player, hence the expression *Organ-striker;* a term in use, even to somewhat comparatively recent times.

Later Organs contained a greater number of pipes, and also of keys. An Organ with 16 keys was erected in the Cathedral at Magdeburg in the 11th century, and esteemed one of the largest of that period. The accounts and descriptions of Organs at that time are so incomplete and imperfect, and evidently written without a proper knowledge of the subject, that a clear understanding of them is difficult. For instance, when the Benedictine Wulston relates, that Bishop Elphege in 951 had an Organ erected in the Cathedral at Winchester, which contained 400 pipes, and 26 bellows which required the strength of 70 men to set in motion, it is evident, that even if the accuracy of the account itself may not be questioned, the *seventy* vigorous bellows-blowers must still remain a perplexing question.

*Q.* Is anything known of the sound, and the effect of such instruments?

*A.* The accounts of these are as uncertain, as they appear incredible. When Charles the Great says of the tones of the Organ, 'they have the thunder, but can also imitate the soft lyre, and the Cymbal;' and again when it is said of the above-mentioned Organ in Winchester, with its 400 pipes and 10 keys, upon each of which are placed 40 pipes, the whole of which sound by pressing down the key; it is not quite clear, how, and in what manner, the separation of the rows of pipes has been made, so as to be able to produce such different effects, as the *sliders* were not invented until a much later period.

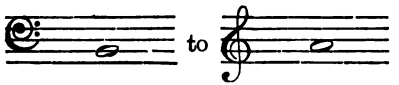
*Q.* Is it known whether the Manual, according to its size, was regulated in a similar manner to the modern system?

*A.* The Manual was arranged according to the then known system of tones, and contained only the diatonic sounds, extending either from B♮ or from C, to e, or to a. The chromatic sounds, or semitones, were not then known, and were of course only introduced at a subsequent period; and thus the Manual formed the ground-work of all our keyed instruments.

*Q.* How was it possible to play in harmony upon an Organ with keys so large and broad?

*A.* The Organ was merely made use of for playing a Melody: at that date Harmony, as we understand *it*, was unknown.

The primitive manner of accompanying a melody, or plain-chant, was in a succession of octaves and fifths,* and this is not considered good in Harmony, but, on the contrary, most objectionable. Later, from the 10th to the 13th century, when Harmony really began to unfold itself, it was soon found necessary to make the keys smaller, that the fingers may be able to press down several of them at the same time. From the 14th century the Clavier began, by degrees, to assume the modern form, by the addition of the chromatic sounds, or semitones. It is related, that an Organ-builder, a priest, Nicolaus Faber, 1359 to 1361, built an Organ in Halberstadt, with 14 so-called diatonic, and 8 chromatic keys or sounds, the compass of which was from




As the number of the pipes and stops increased, attempts were gradually made to separate them by having different Manuals. The above-mentioned Organ in Halberstadt had 3 Manuals: according to some writers, this Organ is also said to have had a set of pedals for the feet; but as the instrument was restored in 1494 by Gregorius Kleng, the pedals may have been added by him.

*Q.* Had the Organs at that time any species of Pedal, and when was the Pedal first used?

*A.* At that date the Pedal was not known. The

* Richter says, that this is now-a-days sometimes heard among the people of Germany.

invention of the Pedal is attributed to a German named Bernhard, an Organist of Nürnberg, 1470, who paid great attention to the music there. Bernhard probably made some *improvements* in the Pedal clavier; as two old *pedal pipes* were found by the Organ builder Marx in an old organ which he took down from the Church of Beeskow, near Frankfort-on-the-Oder; in these two old pipes the date 1418 was found engraved on the upper side of the *kern*, or partition; and the dimensions of these two pipes clearly showed that they belonged to the pedal. The pedal, therefore, may perhaps have been in use towards the end of the 14th century.

Bernhard's name is mentioned in the book of Winterfeld; 'Gabrieli and His Times.'* Of course the Pedal was not originally in its present form and compass; at first it only contained a small number of sounds, about eight, probably taken from the deeper pipes of the Manual; afterwards, at a later period, the Pedal had its own especial pipes and wind-chest. In many old Organs the pedals only pull down the Manual keys, without any particular pedal-pipes; and also in these old Organs the pedal keys often only extended to half an octave, and a *broken* octave.

*Q.* When did the Octave, and the Quint Registers, come into use?

*A.* Very early. The Octave must soon have been found out when the number of pipes was increased; and the Quint was, in a manner, valued in earliest times, as the best kind of harmony then known.

* Gabrieli und sein Zeitalter.

Hucbald and Guido, in the 10th and 11th centuries, mention in their writings, that progressions of 5ths, 4ths, and octaves were the only kind of harmony then known. Some writers suppose this to be the origin of all the Compound Stops, as Mixture, Cornet, Cymbel, &c.

The Organs of that period were especially imperfect as regards the Bellows, which were very small, as only required for a work with proportionally few pipes; but if the account of Prätorius, in his *Syntagma Musicum*, 1619, may be considered reliable respecting the above-mentioned 26 Bellows, and 70 Blowers, they were very difficult to manage, notwithstanding their small size. An Organ at Halberstadt, about 1361, had, according to the description of Prätorius, 20;—and one in Magdeburg 24 Bellows; and in each case they required much strength.

The different kinds of Bellows now in use are described on page 52, Chapter 8.

*Q.* At what time did the Claviers assume their present form and compass?

*A.* About the 16th century the Manuals had attained the compass of 4 octaves, with the chromatic sounds, or semitones: but in the lower octave the sounds C♯, D♯, F♯, G♯, were omitted. The keys, therefore, of this octave, did not occur in the usual order, but extended, apparently, only down to E, see Fig. 24; the E key being used for C; the F♯ key being used for D; the G♯ for E; from A upwards the succession of tones is the same as in the higher

octaves. A Manual of this kind is called a *short octave* manual.

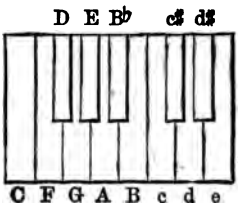



FIG. 24.

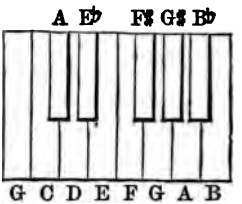



FIG. 25.

Another *short octave* Manual found in the English Organs of the 18th century, and the early part of the 19th, is that shown in Fig. 25, where the sounds extend down to GG.

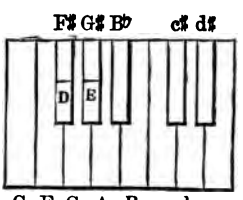



FIG. 26.

There is also another arrangement of the Manual in old Organs called the *broken octave*; in this the sounds in the lowest octave follow in the same order as in the short octave, Fig. 24: but there are *two additional* tones, F sharp and G sharp; the key F sharp lies above D, and the key G sharp above E, as in Fig. 26.

By these contrivances space and expense were saved; the Organs being then always tuned in the unequal temperament, where the remote keys cannot be used, and consequently the C sharp, D sharp, F sharp, and G sharp could be dispensed with.

*Q.* When were the various kinds of pipes first used, and improvements made in them?

*A.* At a very early date many different kinds of material for the pipes were already used; as, metal, and several kinds of wood: and in their construction variations were made, producing different kinds of tone; and these alterations gradually increased, but no date can be given for them. The invention of the wide and narrow measure or scale; especially the introduction of the Stopped pipes (*Gedackte*); the variations in the top of the pipe; the incisions or *nicking*; the beard and the ears; the shape of the body of the pipe, whether cylindrical or conical; all these gave much variety and change. Especial endeavours were also made, in earlier times, to imitate the tones of instruments in general use; and hence, in very old German Organs are found such names as, *Blockflöte*, *Schalmey*, *Krumhorn*, *Bombard*, *Regal*, and others now entirely obsolete:* on the other hand these following are still in use: *Viola di Gamba*, *Gemshorn*, *Dulcian*, *Cornet* or, properly, *Zink*, &c.; besides many other imitations of common instruments now in use.

*Q.* When were Reed stops first introduced?

*A.* They were already known in the 16th century as imitations of instruments; such as *Posaune*, *Trumpet*, *Bombard*, *Barpfeife* (*Bear-pipe*), &c.: or, as imitations of voices, as *Vox humana*, *Jungfernregal* (young-maiden's register), *Vox angelica*, &c.

* Some of these names are, however, being revived in modern Organs. See also p. 74.

In the course of time this species of pipes became abundantly improved and increased. And, as formerly only the *striking* reeds were known, so, when the *free* reed was invented it produced many changes, by which the sounds of certain instruments, as *Fagotto*, *Clarinet*, *Oboe*, could be much more nearly imitated.

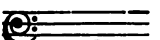
*Q.* Who was the original inventor of the *free-reed?*

*A.* An Organ builder of St. Petersburg, a German named Kratzenstein, first introduced it at the end of the last century.

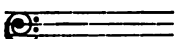
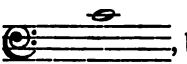
*Q.* When were Organs first made, of the kind now usually built; as regards their structure, and the number and character of the pipes and stops?

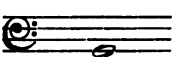
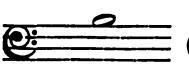
*A.* It is generally admitted, that from the 16th century, the structure of the Organ, the number of the pipes, and their character, were essentially the same as at present; improvements being naturally made from time to time. This may be seen by the many specifications of old Organs extant. Before this period, even in the 15th century, the keys were considerably broader, their number smaller, and the division of the stops mostly consisted in the *Principal* being placed in the 'front' of the case, and therefore, in German Organs, called *Prästant* (or chief stop): and the remaining stops were separated, those consisting mostly of octaves and fifths, were placed behind, and called 'Hintersatz' (*behind-set*), or 'Nachsatz' (*after-set*); afterwards, when there

were separate Manuals, they were not named as at present, but, as Prätorius relates of an Organ at Halberstadt, renovated in 1494, that it had three Claviers and Pedal, the upper one called *Discant* (Treble), extending

from  to ;

the Second Manual, of the same compass, for the *Principal* alone; the Third Manual, the *Bass-clavier*,

from  to  , besides the

Pedal from  to  (See page 149).

Prätorius also says, that *registers*, by which the stops or pipes could be separated, were invented by the Germans in the 16th century: and also the wind-chest: previously a complicated spring wind-chest was used (see page 42), which required frequent repair. The pipes also were improved, and the *stopped* or covered pipes were invented; thus the *stopped-diapasons*, *flute-stops*, &c., were introduced. By using a *small scale*, pipes were produced with a penetrating, yet pleasing tone, in imitation of the *Violin*, *Viol di Gamba*, &c.: and by using a *large scale*, on the contrary, pipes produced that full, round tone, always heard in good Organs. Other pipes were made to taper upwards, such as the *spitz-flöte*, *gemshorn*, &c.: and other pipes were made

wider at the upper end than the lower, as the *Dolcan*, &c.

It is stated that an Organ erected in 1570 in Bernau, had 60 stops, and also a *back-choir*:* the Manuals of this Organ had 48 keys, from CC to $c^3$. The Pedal was from CC to $d^1$. An Organ with 36 stops, 3 Claviers and Pedal, erected about 1596 in the Magdalen church, in Breslau, had, among others, the following stops: *Principal* 16 and 8 feet, *Salicet* 8 feet, *Quintatön* 8 feet, *Nassat* 2 and 3 feet, *Gemshorn* 4 feet, *Quintatönbass* 16 feet, *Sub-bass* 32 feet, *Regal of brass* 8 feet, *Singing Regal* 2 feet, *Trumpet* 8 feet, *Krumhorn* 8 feet, *Sordinenbass* 16 feet, *Posaune* 16 feet, *Cornettbass* 2 feet. From this it appears that at that period the Organ contained the same species of Stops as at present; the same arrangement as to the Claviers; and the fundamental features of the whole were the same, various improvements being made from time to time, as is now the case.

*Q.* Which of the Organ builders have attained the most eminence in the Art?

*A.* In the early centuries there are not many records of the names, nor of the improvements introduced by the various builders into each single Organ, but the scarcity of such notices is not of much importance. Some of these are first mentioned in the 17th century, as, for instance, Euge-

* The *Back-choir* (Rückpositiv) is a Choir Organ where the pipes are placed at the *back* of the Organist, or *behind* him. See page 46.

nius Casparini, who, with his son, 1691 to 1697, built the once famous Organ in the church of St. Peter, in Görlitz; with 57 Registers, 3 Manuals and Pedal, the latter containing a *Principal* 32 feet, which stood in front.

In the 18th century Gottfried Silbermann, of Freiburg in Saxony, was particularly eminent, and his work, in Saxony, is still considered excellent, and bearing evidence of great skill; although in the mechanical details he is surpassed by modern builders, yet in reference to the Tone, and united effect, his work is not to be excelled. He built most of his celebrated Organs in Dresden from 1720 to 1754: afterwards he was in partnership with his son or nephews, who, after his death, built many Organs in Strasburg, &c. Besides these, there were, in the latter part of the 18th century, Hildebrand, a disciple of Silbermann; also, Röder, in Berlin; Joachim Wagner, in Berlin; Michael Engler, in Breslau; and others.

In the 17th century the famous Bernard Schmidt came to England from Germany, and brought his two nephews, Gerard and Bernard: and to distinguish him from these, as well as to express the reverence due to his abilities, which placed him in the first rank of his profession, he was called Father Smith.* He built Organs for the Royal Chapel at Whitehall; Westminster Abbey; St. Giles's-in-the Fields; St. Margaret's, Westminster; and the celebrated Organ for the Temple church, for which he

* Burney's History of Music, Vol. iii. p. 436.

had to contend with a formidable rival in Renatus Harris, who arrived here from France soon after Smith came from Germany. The particulars of this contest are too long to be inserted here, but they will be found in Burney's History.

Smith also built the Organ for Durham Cathedral, and for St. Paul's Cathedral, the case of which was decorated with carving by the celebrated Grinling Gibbons; and many other Organs both in London, and in the country.

Harris came over to England with his son René or Renatus, about the same time as Father Smith; they built the Organs in St. Sepulchre's, Newgate Street; Gloucester Cathedral; and many others.

In the 18th century the most celebrated Organ builders were Gerard Smith (Father Smith's nephew): John Harris* and John Byfield: Christopher Schrider, or Schreider (formerly a workman of, and afterwards son-in-law and successor to Father Smith): Thomas Schwarbrook: the Jordans,† father and son: Richard Bridge: John Byfield, jun.: John Snetzler: Samuel Green: John Avery: the Englands, father and son.

The 19th century is far richer in eminent names of Organ builders: among others who by great and important works have made themselves celebrated, are, in Germany: Eberhard Friedrich Walker, in Ludwigsburg, builder of the great Organs in the

* Son of Renatus Harris.

† The inventors of the Swell. See page 4.

Cathedral at Ulm;* at Frankfurt-o.-M.; in Petersburg; in Boston, and other places in North America: J. F. Schulze and Son, in Paulinzelle, who introduced the concave or circular Pedal clavier, both sides being somewhat raised; he built Organs in Lubeck, Bremen, and elsewhere: Friedrich Ladegast in Weissenfels, built Organs in Merseburg, Leipzig, and other places. There are many other excellent builders in Germany, but it is scarcely possible to mention all their names.

The most eminent English Organ builders at the present time are, amongst others, Hill and Son, Gray and Davison, Willis, Walker, Bishop and Son, Hedgeland, Bevington, Holditch, Bryceson, Gern, Forster and Andrews, Hunter, Lewis and Co., Robson, Wedlake, &c. &c. In modern Organs there is always a constant striving after improvements, which are shown in the Intonation, and the character of the Stops, in their united effect; and, especially, the mechanical part is brought to a perfection which takes away all comparison with the older instruments.

*Q.* What comparisons may be made with regard to German Organ builders, and those of other countries?

*A.* As the specifications already given of French and English organs indicate, there are many peculiar arrangements of the Stops, and their different species; and therefore the effect must naturally be different. A French Organ, like the Organs of

* At the present time the largest in Germany.

Holland, is generally of acute intonation; but the number, and the employment of the Reed Stops, is greater in a French than a German Organ, and greatly resembles their much used instruments of the Harmonium species. In the German Organs the foundation is of a softer, flute-like kind, which neither gives too much power and fulness, nor sharpness and pungency to the combined effect. The mechanism, and all that belongs to the action, of the French organs is excellent; and the American and English builders are inventive. Recently the German Organ builders have much striven after improvements, yet it is evident that they all avoid very complicated mechanism, and try to combine solidity with moderate expense.

*Q.* When and where was the pneumatic Lever first employed?

*A.* As already mentioned, page 125, it was the invention of an Englishman named Barker, about 1832; at that time there were no very large Organs in England, and Mr. Barker was not successful in then introducing it in this country. He subsequently went to France, where the value of his invention was at once appreciated, and it was immediately introduced into the large Organ building for St. Denis, 1841; it has since been applied to many large instruments in France, England, Germany, &c.: and it is said that Prof. Topfer, in Weimar, has introduced some improvements in it.

*Q.* What is the Electric Organ?

*A.* An Organ in which the system of Trackers, Stickers, Backfalls, &c., is done away with; and the whole of the action is performed by means of electricity. The Electric action was originally invented by Mr. Barker, the inventor of the Pneumatic Action; but some improvements have been made in it by Messrs. Bryceson, which they have secured by a Patent.

*Q.* What is meant by the *Simplification* system?

*A.* It is a method invented by the Abbé Vogler about the end of the 18th and the beginning of the 19th centuries, and intended to simplify the whole of the Mechanism of the Organ, and to do away with everything superfluous, inappropriate, or too costly. The action was made more simple, by arranging the grooves and pallets in their natural chromatic succession, by which the key movement was supposed to become more easy and less complicated, and the touch lighter. The CC groove was placed to the extreme left, and the $f^3$ in alt groove to the extreme right: all the small pipes being therefore placed at the right end of the sound-board, and the large pipes at the left end: the intermediate pipes forming a graduated series between them.

The advantages of this semitonal arrangement are said to be: that the pipes, being placed chiefly, or entirely, over their own wind, speak more promptly and plumply, and with a firmer tone than pipes grooved, or conveyanced off. But the disadvantages of this, are: the chief weight of the pipe-work being thrown to one end of the sound-board, and consequently increased consumption of

wind taking place at that end. The front pipes to the right would also either require longer conveyances, or, a special little sound-board for their separate use; or else be mute pipes instead of speaking ones.

Another advantage is said to be, that rollers, and roller-boards, are almost wholly unnecessary, the action being in a direct line from the key to the pallet; but the disadvantage of this is, that the pallet must be at a sufficient distance from the key to allow of the necessary spread of the action, and this often requires more space than can be obtained. Besides this, there is the one-sidedness of the appearance, and of convenience for the front. The additional weight, and the greater consumption of wind at one end, may be provided for by a stronger building frame, and larger wind-trunks.

It is, however, generally considered, that the disadvantages of this system outweigh its advantages.

Another invention of the Abbé Vogler was, by the use of two registers, to obtain a third sound which really did not exist in the Organ. Thus, the simultaneous use of a 16 feet and a $10\frac{2}{3}$ feet register, produced the 32 feet-tone: or, the combination of an 8 feet and a $5\frac{1}{3}$ feet produced the 16 feet-tone: see page 69.

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| Pro Peccatis (Stabat Mater) | *Rossini* |
| Quanto e Bello | *Paisiello* |
| Regna il Terror | *Rossini* |
| Religious March of the Ancient Welsh Monks | *Welsh Air* |
| Return, O God of Hosts (Samson) | *Handel* |
| Romanza in E minor | *Spohr* |
| She Never Told Her Love (Canzonet) | *Haydn* |
| Swell the Full Chorus (Solomon) | *Handel* |
| Tantum Ergo | *Winter* |
| The Lord Descended (Anthem) | *Dr. P. Hayes* |
| Voluntary in C, introducing the Sicilian Mariners' Hymn | *J. Harrison* |
| Voluntary in D | *J. Harrison* |
| Voluntary in E flat | *J. Harrison* |

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| Voluntary in F | *J. Harrison* |
| Voluntary in G | *J. Harrison* |
| Voluntary in G | *Walond* |
| Zadock the Priest (Coronation Anthem) | *Handel* |

## VOLUME III.

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| Adagio (Sonata) | *Paradies* |
| Adagio Cantabile (Sonata, Op. 30) | *Beethoven* |
| Adorabunt Nationes | *Himmel* |
| Ah Grazie (Clemenza di Tito) | *Mozart* |
| Air in A | *Haydn* |
| Air in A | *Beethoven* |
| Air in C | *Felton* |
| Air in E | *Viotti* |
| Air in E flat | *Clementi* |
| Air in E flat | *Stelbelt* |
| Air in F | *Mozart* |
| Air in G | *Cambini* |
| Air in G | *Rameau* |
| Air (Op. 1) | *Weber* |
| Allegretto | *Max Keller* |
| Allegro Quasi-Andante | *Rink* |
| Andante Cantabile | *Mozart* |
| Andante Grazioso | *Meyerbeer* |
| Andante (2nd Hautboy Concerto) | *Handel* |
| Andante (Septuor, Op. 74) | *Hummel* |
| Andante (Sonata, Op. 2) | *Mozart* |
| Andante in A | *Haydn* |
| Andante in A minor | *Max Keller* |
| Andante in B flat | *Kozeluch* |
| Andante in C | *Kalkbrenner* |
| Andante in C (Op. 14) | *Mozart* |
| Andante in C | *Rink* |
| Andante in C (Symphony) | *Haydn* |
| Andante in C | *Hummel* |
| Andante in C (2) | *Hummel* |
| Andante in D (Symphony) | *Haydn* |
| Andante in F | *Max Keller* |
| Andante in F (1) | *Max Keller* |
| Andante in F (2) | *Max Keller* |
| Andante in F | *Winter* |
| Andante in G | *Max Keller* |
| Andante Siciliano (Op. 138) | *Reissiger* |
| Andantino Grazioso (Op. 77) | *Reissiger* |
| Andantino in D | *Max Keller* |
| Andantino in E | *W. Russell* |
| Andantino in G | *Neukomm* |
| Andantino Religioso | *A. F. Müller* |
| Andantino (Sonata) | *D. Stelbelt* |
| Aria in A | *Max Keller* |
| Aria in B flat | *J. B. Cramer* |
| Aria in C | *Gluck* |
| Aria in D (Sonata) | *Dussek* |

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| Aria in D | *Handel* |
| Aria in E flat | *Dussek* |
| Aria in F | *Beethoven* |
| Aria in F sharp minor | *Mendelssohn* |
| Arietta in B flat | *Max Keller* |
| Arietta in E flat | *Asioli* |
| Ave Maria | *Cherubini* |
| Ave Maria (Lady of the Lake) | |
| Ave Verum (Offertorium) | *Mozart* |
| Benedictus (1st Mass) | *Hummel* |
| Benedictus (10th Mass) | *Mozart* |
| Benedictus (12th Mass) | *Mozart* |
| Be Peace on Earth (Palestine) | *Dr. Crotch* |
| Cantabile in E flat | *Max Keller* |
| Cantabile in G | *Max Keller* |
| Cantabile (Sonata) | *Haydn* |
| Chorale | *Hummel* |
| Christe Eleison (Mass) | *Casali* |
| Come, Gentle Spring (Seasons) | *Haydn* |
| Con Grazia e Moderato | *Mozart* |
| Credo (1st Mass) | *Haydn* |
| Deh Calma o Ciel (Otello) | *Rossini* |
| Eia Mater (Stabat Mater) | *Rossini* |
| Et Incarnatus (1st Mass) | *Haydn* |
| Et Vitam Venturi (Mass) | *Perti* |
| Funeral March (Requiem) | *Koslovsky* |
| German Air | *Haydn* |
| Gloria (1st Mass) | *Haydn* |
| Grand March of Priests (Die Vestalin) | *Guhr* |
| Hail Judea! Happy Land (Judas Maccabeus) | *Handel* |
| He Maketh Peace (Anthem) | *Dr. W. Hayes* |
| Il Mio Tesoro (Don Giovanni) | *Mozart* |
| Immortal Pleasures (Joseph) | *Handel* |
| Italian Melody | |
| Kyrie Eleison (12th Mass) | *Mozart* |
| Larghetto in A | *Rink* |
| Largo in F | |
| Largo in G | *Pelham Humphries* |
| Largo (Op. 1) | *Chapple* |
| Largo (Quintett, No. 1) | *Pleyel* |
| Largo Sostenuto (Overture, Op. 7) | *Abel* |
| Let all the Angels (Messiah) | *Handel* |
| Lieti Fiori | *Winter* |
| March in D | *S. Wesley* |
| March of Priests (Die Vestalin) | *Guhr* |
| March to Battle (Joshua) | *Handel* |
| Moderato in F | *Max Keller* |
| O be Gracious (Seasons) | *Haydn* |
| O Lord, in Thee (Dettingen Te Deum) | *Handel* |
| Panis Vivus (Litania di Venerable Sacramentum) | *Mozart* |
| Pastoral Movement (Op. 1) | *Fr. Schneider* |
| Placido e il Mar (Idomeneo) | *Mozart* |
| Prelude in A | *A. W. Bach* |
| Prelude in C | *A. W. Bach* |

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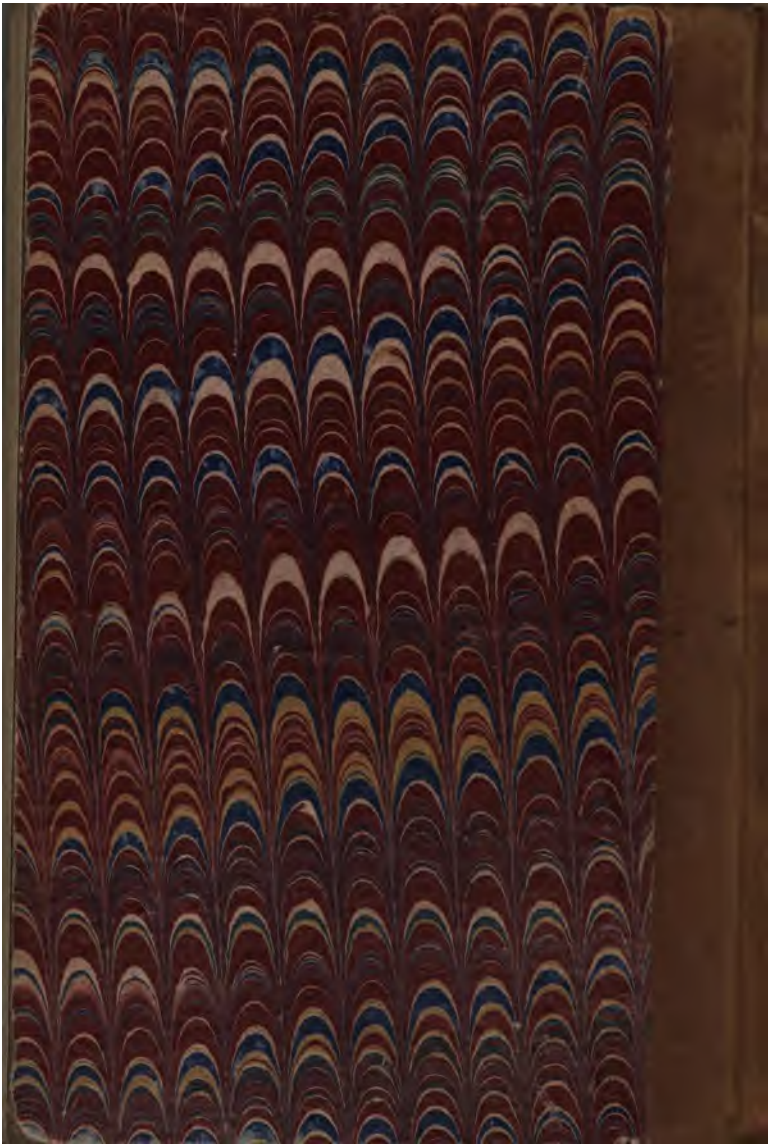
| Prelude in D | *A. W. Bach* |
| Prelude in D | *Rinck* |
| Prelude in E flat | *A. W. Bach* |
| Prelude in F | *A. W. Bach* |
| Prelude in G | *A. W. Bach* |
| Quis est Homo (Stabat Mater) | *Rossini* |
| Romance in G | *Dussek* |
| Romance (Symphony, No. 14) | *Haydn* |
| Romanza (Euryanthe) | *Weber* |
| Romanza in D | *Hummel* |
| Siciliana in G | |
| Softly Sweet in Lydian Measures (Alexander's Feast) | *Handel* |
| Sweet Sabbath Morn (Omnipresence of the Deity) | *Barnett* |
| Tears such as Tender Fathers Shed (Deborah) | *Handel* |
| The Great Jehovah (Joshua) | *Handel* |
| The Heavens are Telling (Creation) | *Haydn* |
| Theme (Written in an Album) | *Mozart* |
| The Proud have Digged Pits (Anthem) | *Dr. Tye* |
| Trio for 2 Manuals and Pedale | *J. G. Werner* |
| Trio for 2 Manuals and Pedale | *Viotti* |
| Un poco Allegretto | *Hummel* |
| Upon Thy Right Hand (Coronation Anthem) | *Handel* |
| Veni Sancte Spiritus | *Schicht* |
| Volkslied in F | *Mendelssohn* |
| Volkslied in G | *Weber* |
| Voluntary in A (Swell) | *W. Russell* |
| Voluntary in E flat | |
| Voluntary in F (Choir Organ) | *W. Russell* |
| Wiegenlied (Cradle Song) | *Spohr* |

## VOLUME IV.

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| Adagio Cantabile (Sonata, Op. 34) | *Lauska* |
| Adagio in C | *Russell* |
| Adagio in D (Quartett, Op. 74) | *Haydn* |
| Adagio in D (Sonata, Op. 68) | *Haydn* |
| Adagio in F | *Rinck* |
| Adagio (Quartett, Op. 1, No. 2) | *Pleyel* |
| Adagio Non Troppo | *Hummel* |
| Adagio (Sonata, Op. 2) | *Beethoven* |
| Agnus Dei (1st Mass) | *Mozart* |
| Air in C | *Pleyel* |
| Allegretto Grazioso | *Julius André* |
| Allegro in E flat | *Max Keller* |
| Allegro Moderato (Op. 31) | *Hesse* |
| All We like Sheep (Messiah) | *Handel* |
| Amplius Lava Me (Miserere) | *Sarti* |
| Andante Affettuoso (Symphony) | *Romberg* |
| Andante Grazioso (Op. 3) | *Martini* |
| Andante in A | *Viotti* |
| Andante in A | *Meister* |
| Andante in B flat | *Max Keller* |
| Andante in B flat | *Mozart* |